Alkuraskauden UÄ – mitä tarkistan, mistä huolestun?

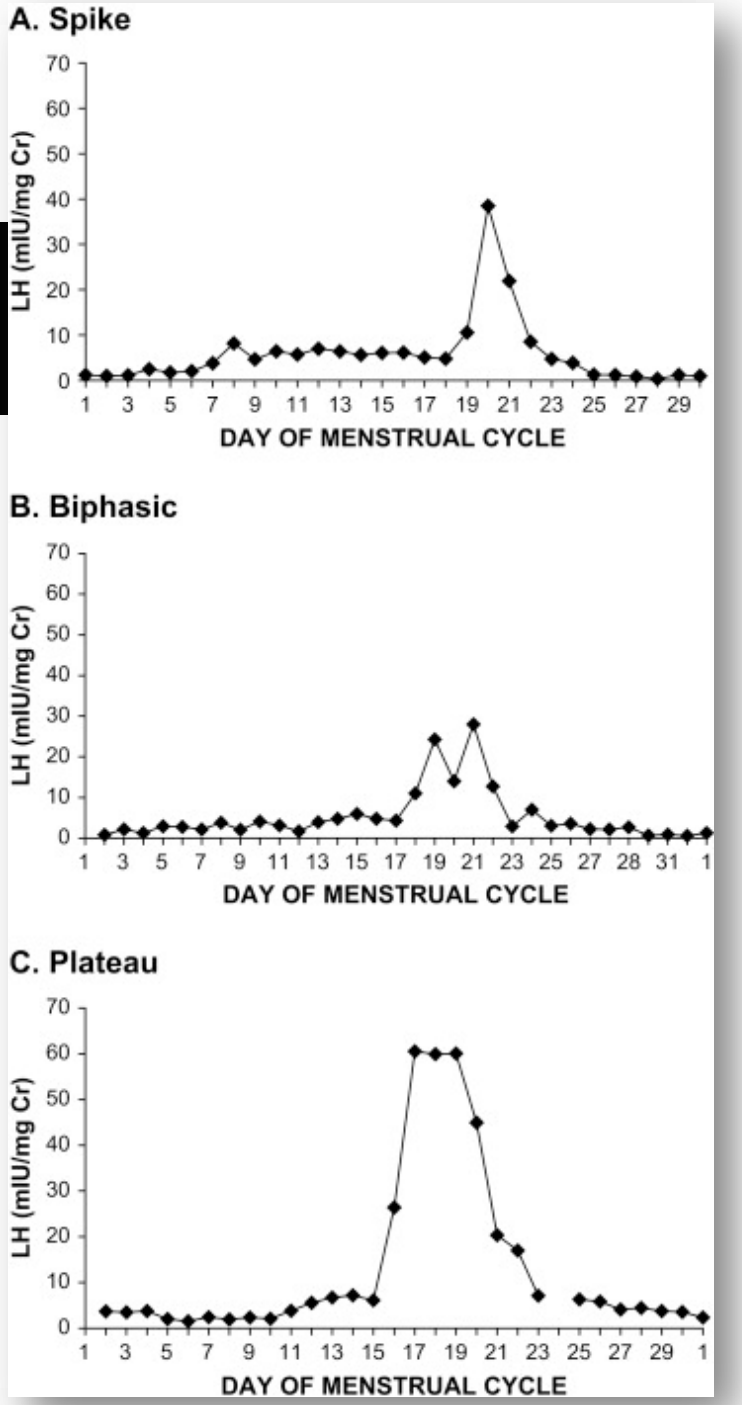
Reproendopäivät Helsinki 17.-18.2.2011

Ilkka Järvelä, OYS

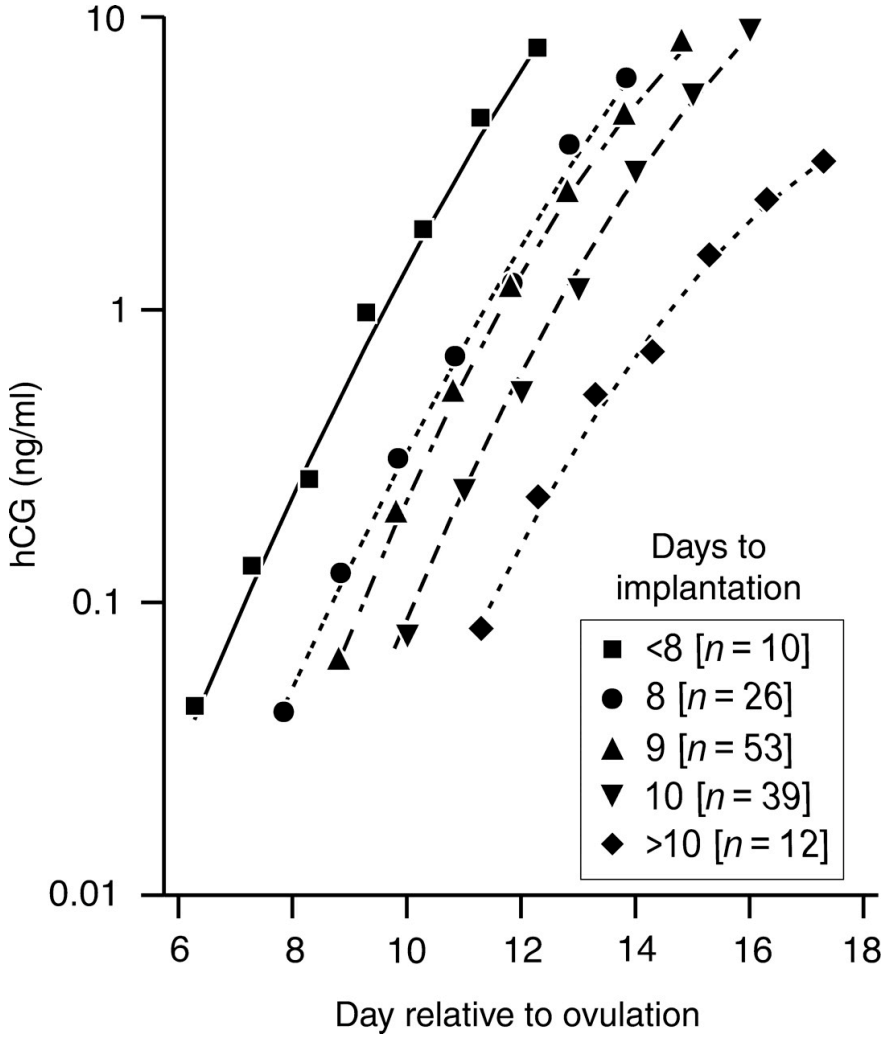
LH ja implantaatio

- Kp 20-24
  - 5-9 vrk post ovul

- Park S 2007



Daily hCG trajectories by time elapsed between ovulation and first hCG detection (i.e. time to implantation) for 142 clinical pregnancies during the first week of detection



Nepomnaschy, P.A. et al. Hum. Reprod. 2008 23:271-277; doi:10.1093/humrep/dem397

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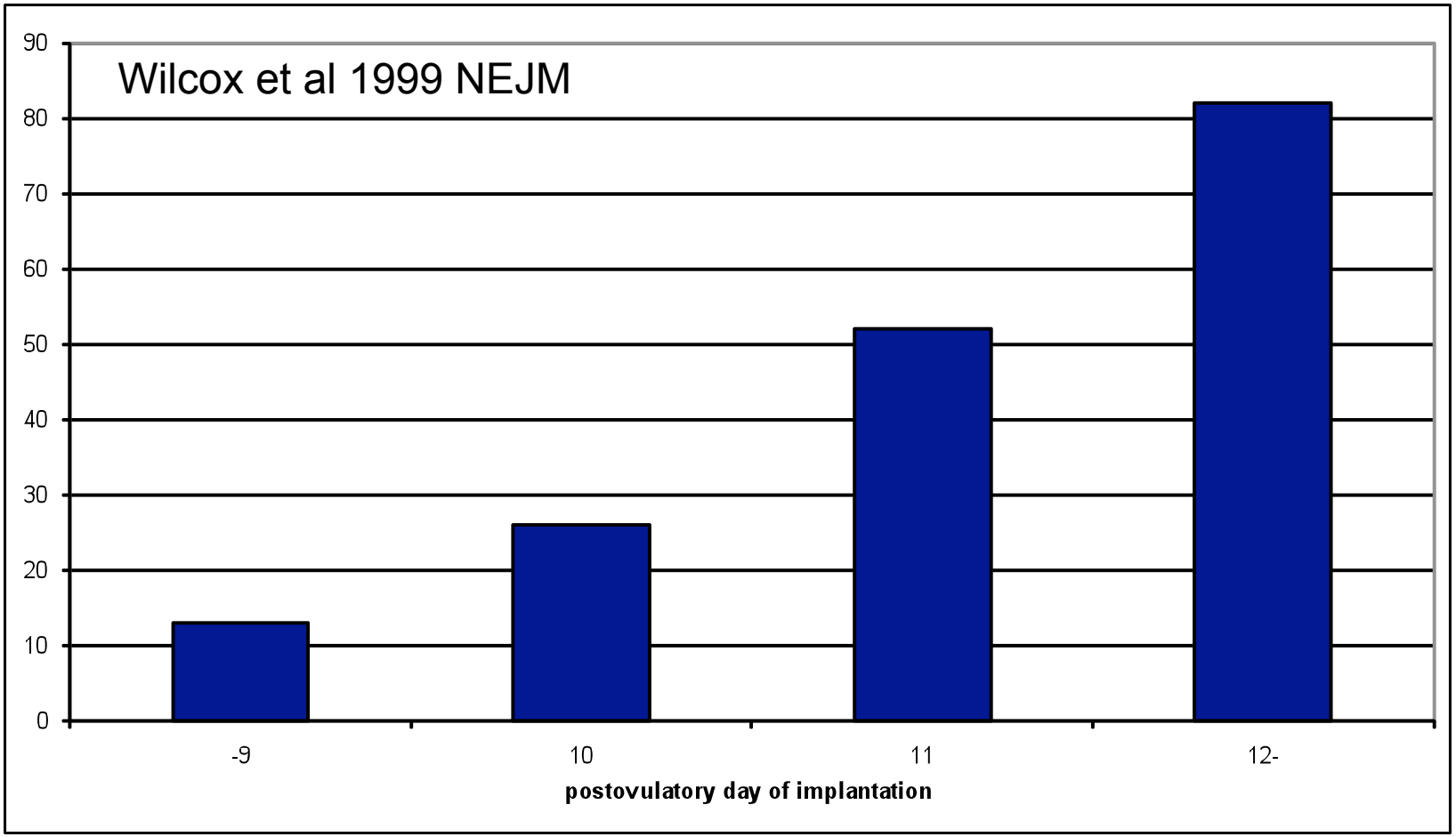
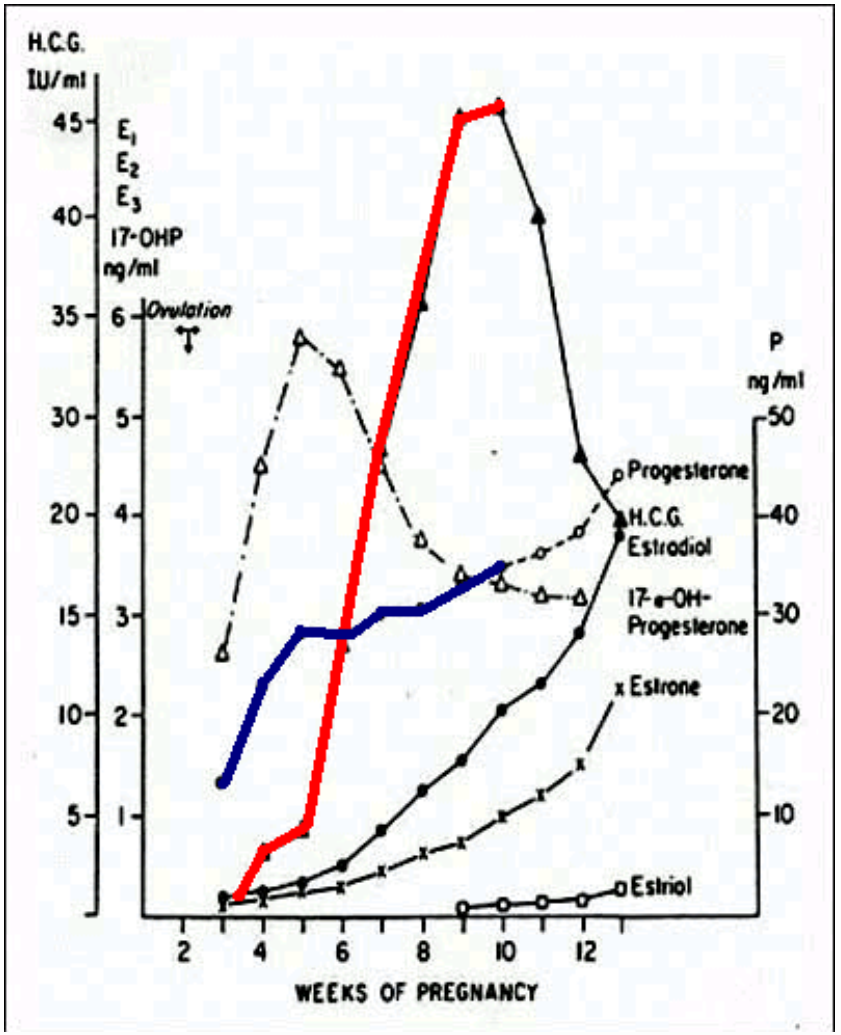
Miscarriage rate (%)

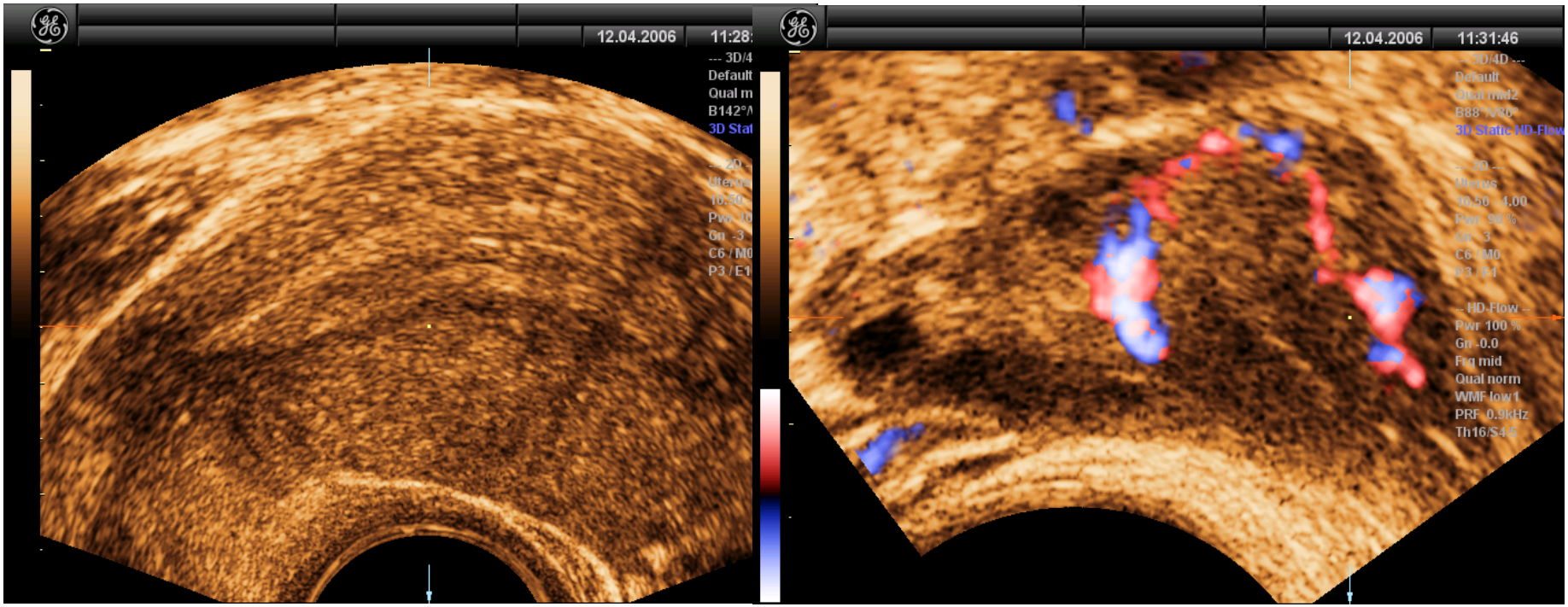


hCG ja progesteroni

- hCG äidin verenkierrossa jo 8 vrk ovulaation jälkeen
- hCG stimuloi keltarauhasen P tuotantoa



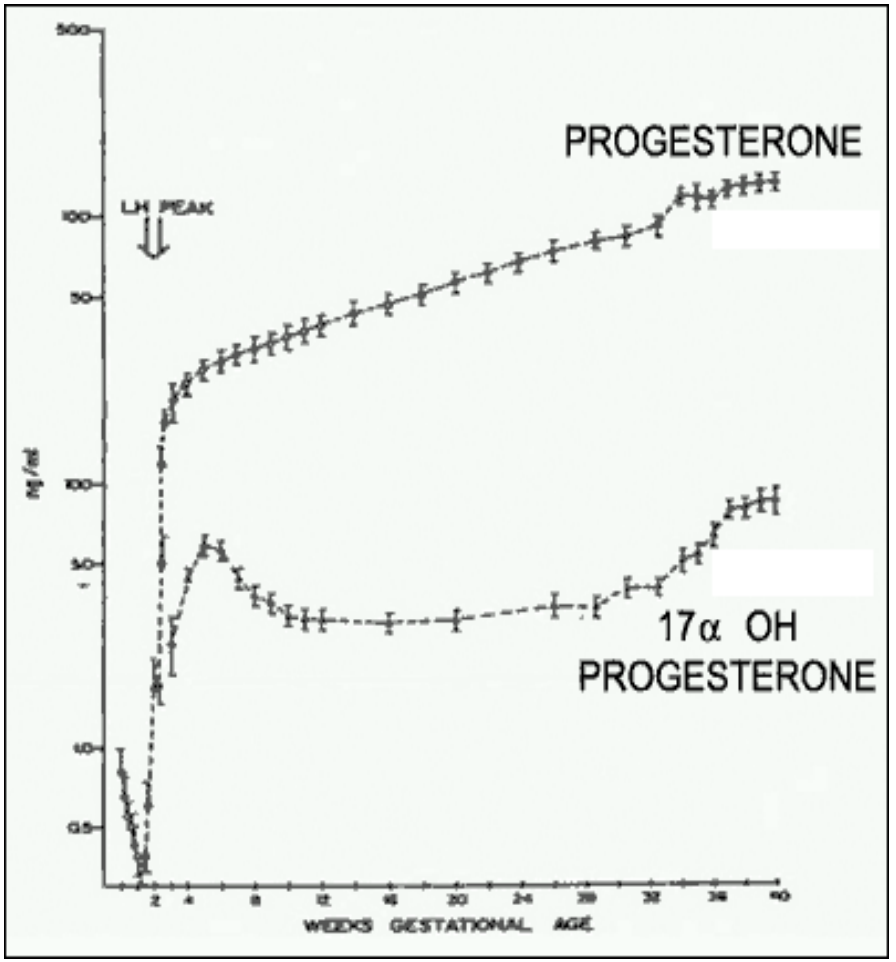
CORPUS LUTEUM



..\3-D\SonoView\alkuraskaus\IVF\DRS, u-hCG+, UT.vol

Progesterone

- endometrial decidualization
- smooth muscle contractility ↓
- prostaglandin (PG) formation ↓
- immune responses ↓
  - inhibits T-lymphocyte-mediated tissue rejection



CL:n merkitys alkuraskaudessa

Table I. The effect of luteectomy plus estradiol treatment on plasma steroid levels and pregnancies of early first trimester patients

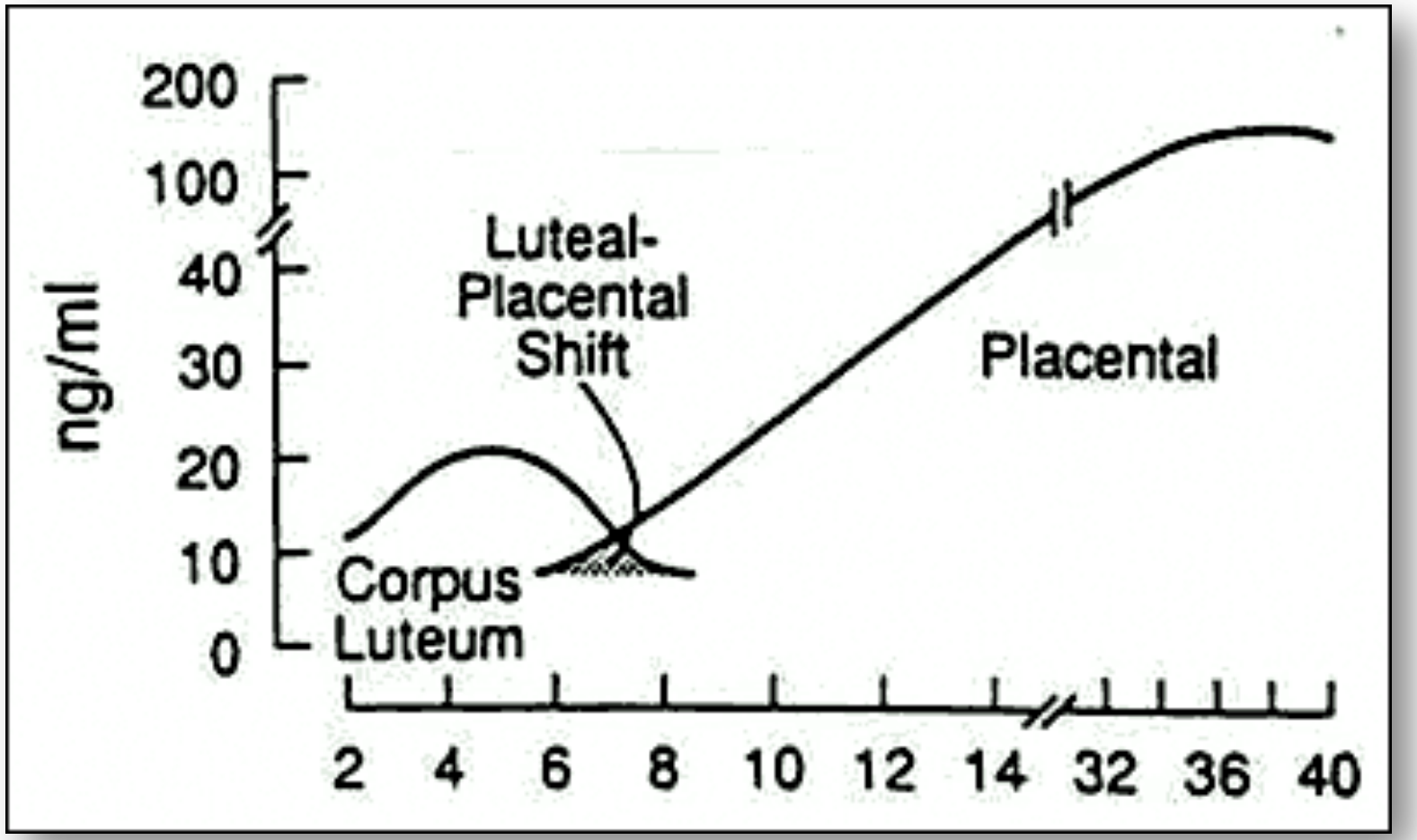
No. of patients	*Amenorrhea (days)*	*Abortion (days)*	*Steroid*	*Plasma steroid levels (ng./ml.)*						
				Day 0	*Day 1*	*Day 2*	*Day 3*	*Day 4*	*Day 5*	*Day 6*
5	18.9 ± 1.9	4.8 ± 0.6	Progesterone	18.4*	3.2	2.4	1.8	1.6	1.6	1.2
	6+3 – 7+0			3.2†	0.6	0.6	0.4	0.7	0.7	0.3
			Estradiol	0.5	0.7	0.6	0.7	0.6	0.7	0.6
				0.1	0.1	0.1	0.1	0.1	0.2	0.1
2‡	22.5 ± 1.5	6.5 ± 0.5	Progesterone	11.4	2.7	2.4	2.5	2.9	3.3	3.2
	7+0 – 7+3			2.6	0.9	0.4	0.5	0.5	1.7	1.1
			Estradiol	2.3	1.5	2.2	2.1	1.8	2.0	1.7
				1.9	1.2	1.7	1.7	1.4	1.3	1.3
3	29.7 ± 2.7	No abortion	Progesterone	23.9	11.4	11.8	11.9	9.0	13.2	12.0
	7+6 – 8+5			4.2	2.7	3.9	3.8	1.2	3.3	3.0
			Estradiol	1.1	0.8	1.0	1.1	1.2	1.3	1.2
				0.1	0.1	0.1	0.2	0.1	0.1	0.2

*Mean.

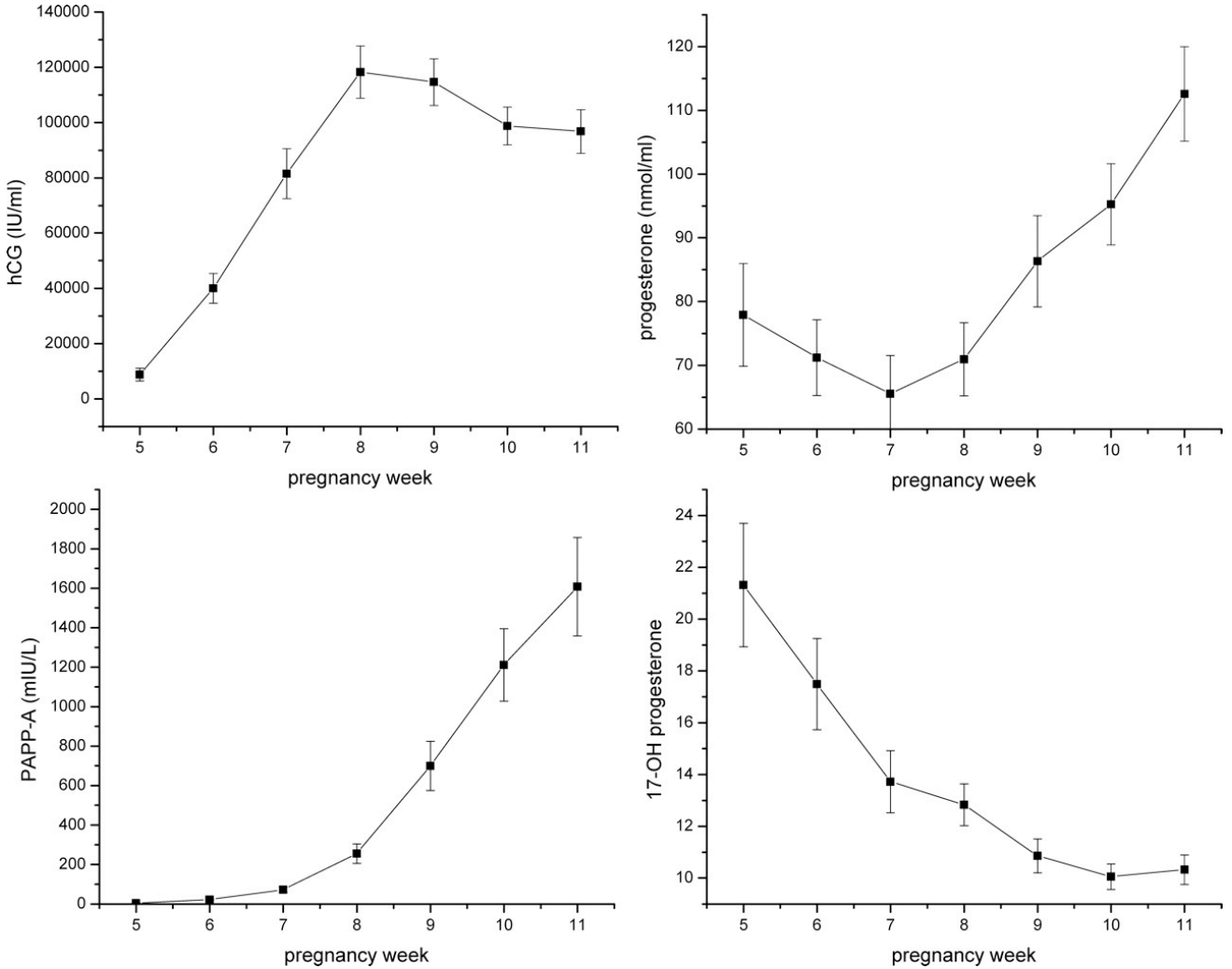
†Standard error.

‡These 2 patients had incipient abortion. One of them received 5 mg., rather than 1 mg., of estradiol monobenzoate per day.

Luteal-placental shift



The behaviour of hCG, PAPP-A, progesterone and 17-OHP between pregnancy weeks 5 and 11



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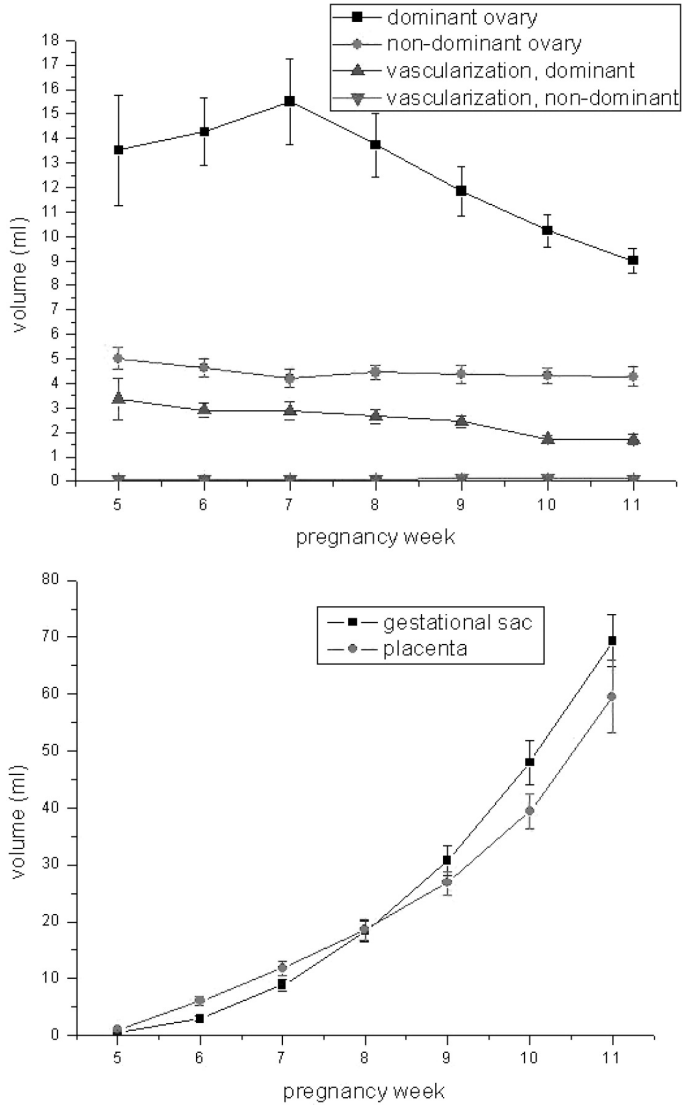
Jarvela, I. Y. et al. Hum. Reprod. 2008 23:2775-2781; doi:10.1093/humrep/den299

Human Reproduction

The changes in the dominant and the non-dominant ovarian, the gestational sac and the placental volumes between pregnancy weeks 5 and 11



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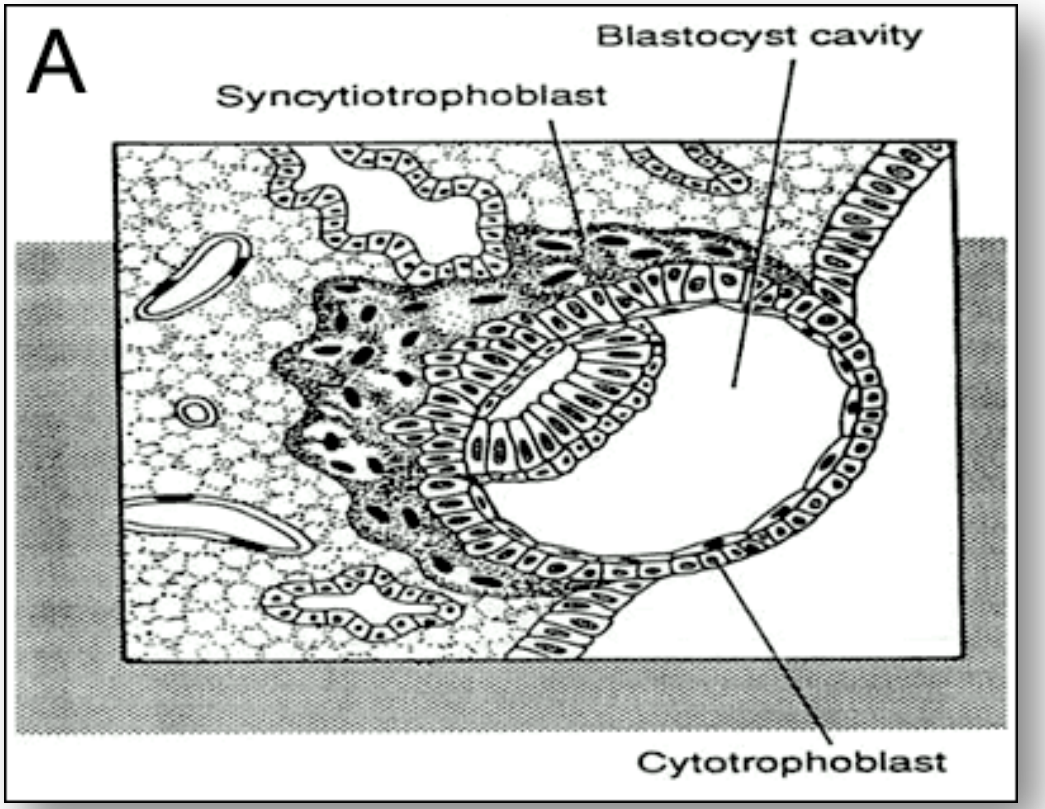
Jarvela, I. Y. et al. Hum. Reprod. 2008 23:2775-2781; doi:10.1093/humrep/den299

Human Reproduction

Placental development

- 10 days post-conception:
  - cytotrophoblast
    - hypothalamic-like protein hormones
      - GnRH
      - CRH
      - TRH
  - syncytiotrophoblast
    - pituitary-like peptide hormones
      - hCG
      - ACTH

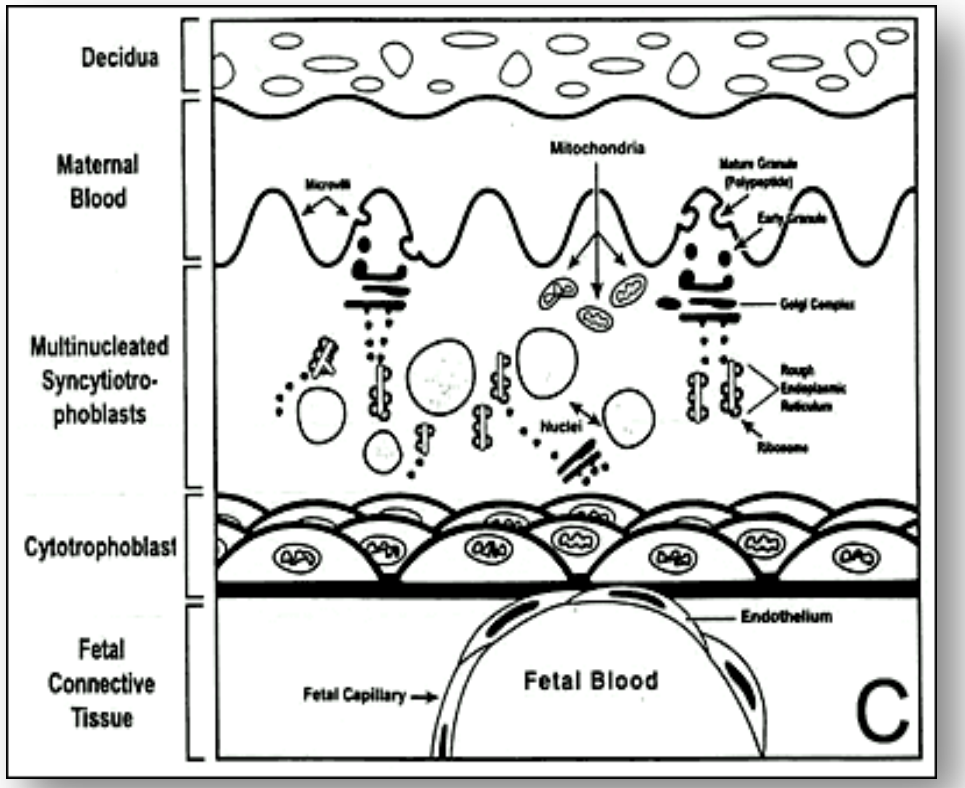
≈ hypothalamic-pituitary - axis



8th day after ovulation: s-hCG +

Secretion of placental proteins

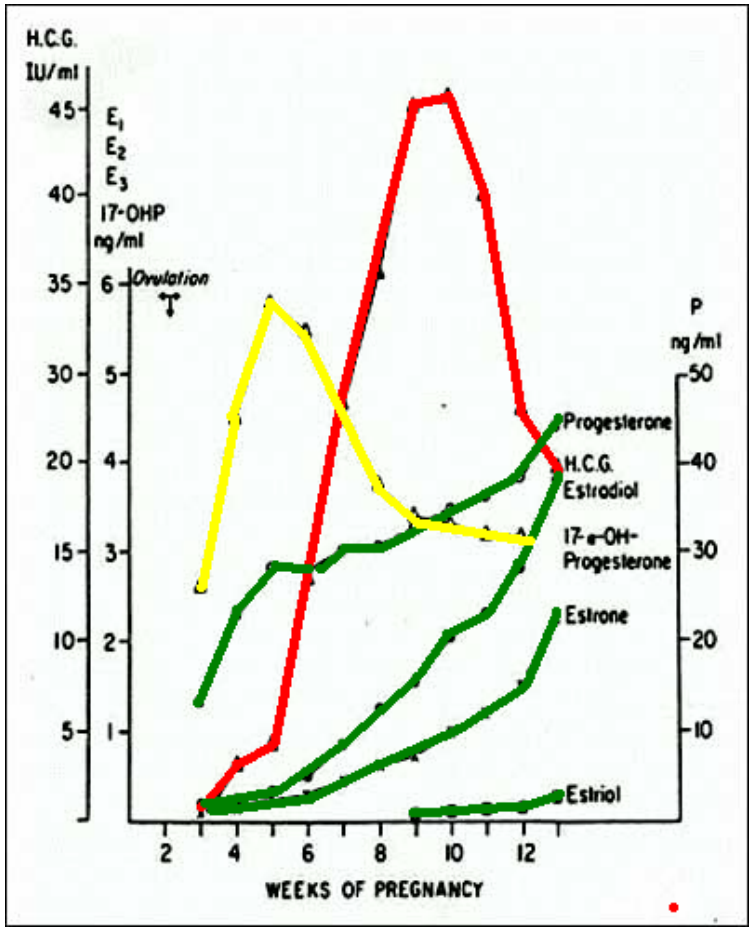
- syncytiocytotrophoblasts
  - synthesis of placental steroids and proteins
  - large surface area
  - line the intervillous space
  - directly to maternal bloodstream without the vascular endothelium and basement membrane which separates them from the fetal circulation
- placental proteins secreted almost exclusively into the maternal circulation



Steroidit

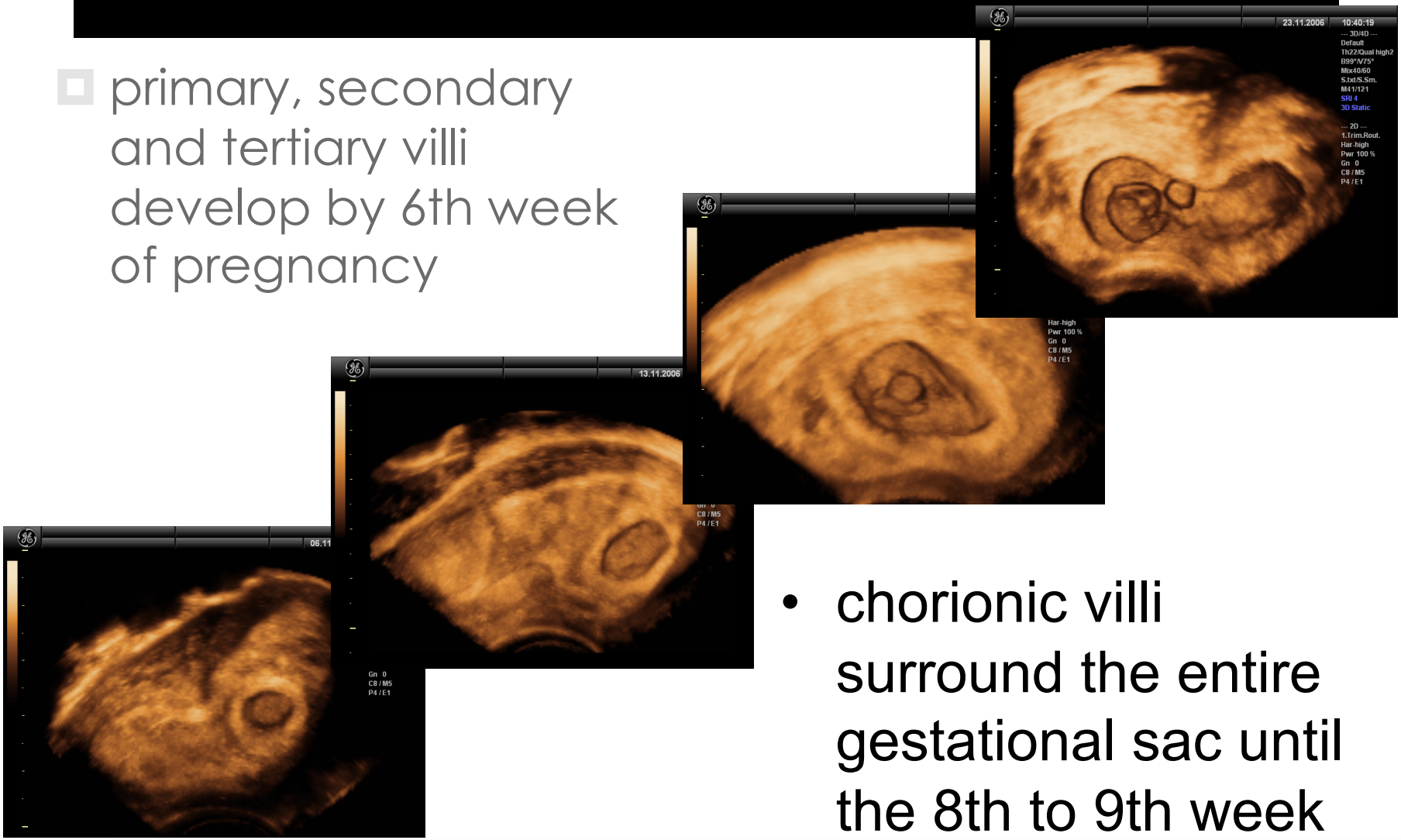
- progesteroni
- estradioli
- estrone
- estriol

- Pääasiassa keltarauhasesta <6rvk
- Pääasiassa istukasta >6rvk



Placental development

- primary, secondary and tertiary villi develop by 6th week of pregnancy



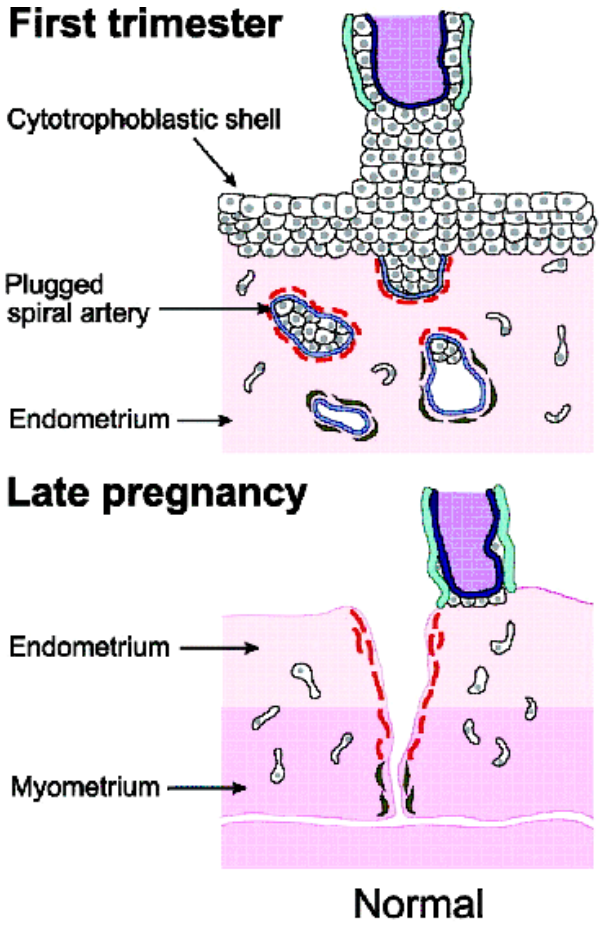
- chorionic villi surround the entire gestational sac until the 8th to 9th week

Placenta, end of 1st trimester

- up to 10 weeks feto-placental blood flow is limited
  - placental villi display only a few capillaries
  - fetal blood extremely viscous
- 10-14 weeks gestation
  - two-thirds of the primitive placenta disappears

Placental maturation

- 1st trimester
  - increase in trophoblast tissue
    - SECRETORY FUNCTION
- 2nd and 3rd trimester
  - number of trophoblasts decline
  - remaining syncytial layer thin
    - TRANSPORT OF COMPUNDS

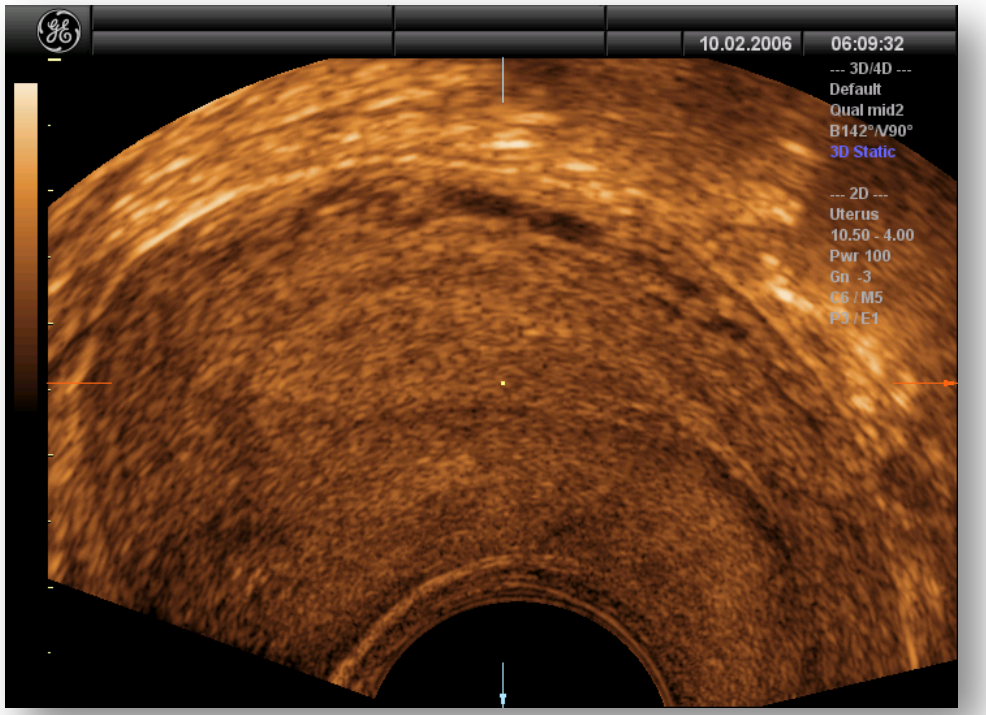


Jauniaux, E. et al. Hum Reprod Update 2006

Jauniaux, E. et al. Hum Reprod Update 2006 12:747-755; doi:10.1093/humupd/dml016

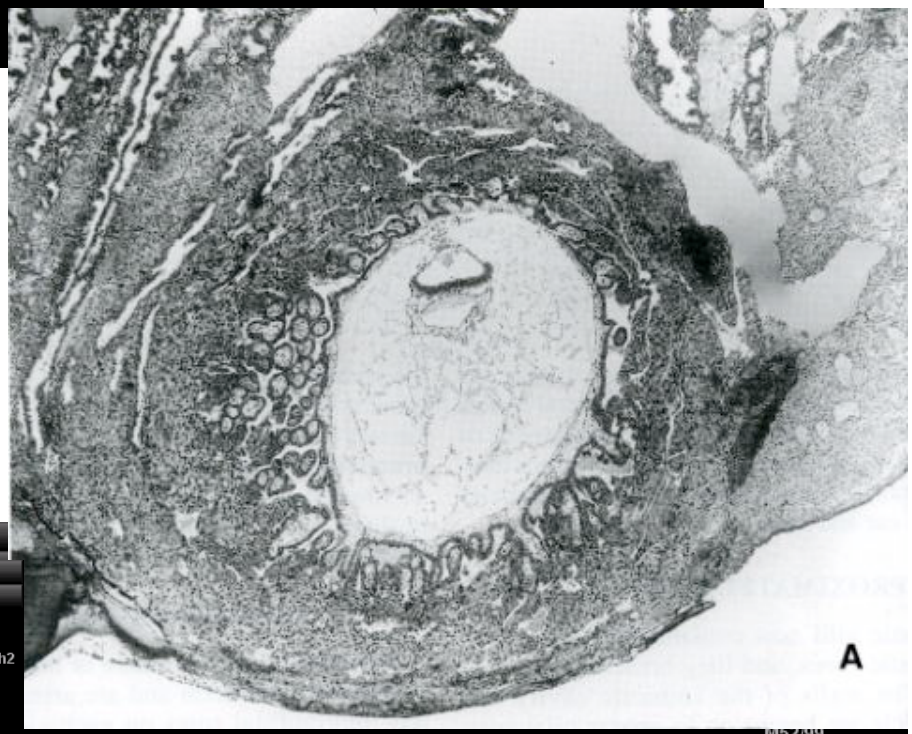
RVK 4

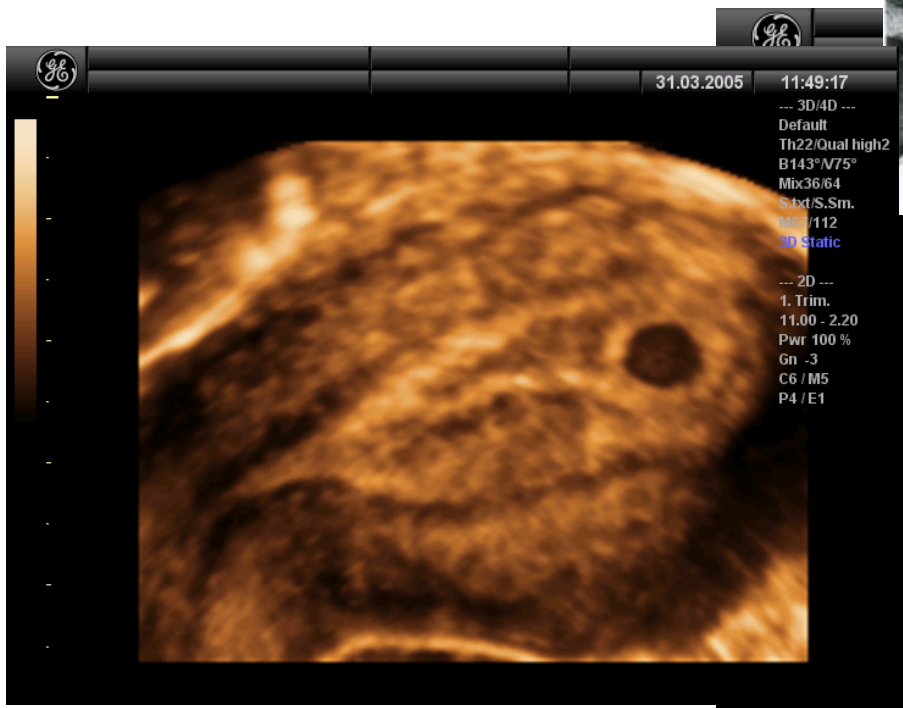
- endometrium raskausaikana = decidua
  - paksu
  - runsaskaikuinen
  - triple line ei selvä

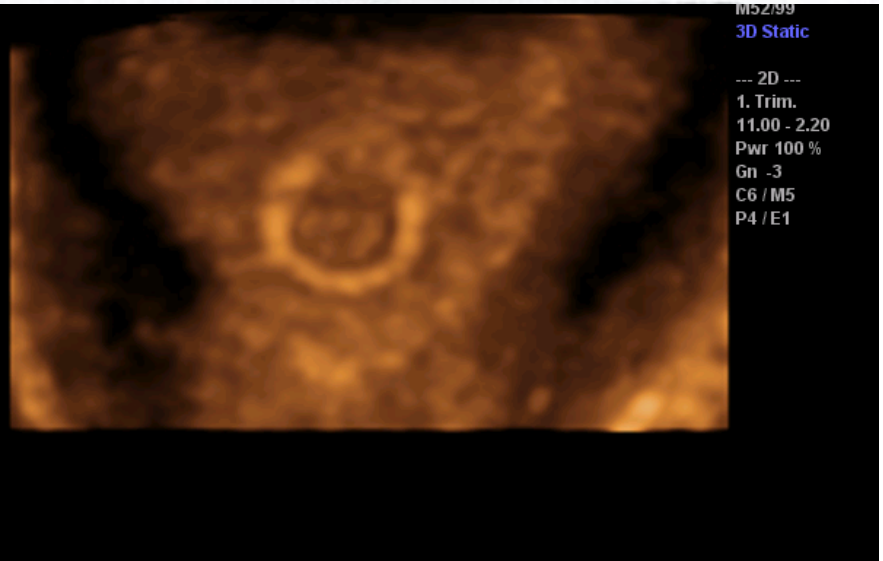


RVK 5

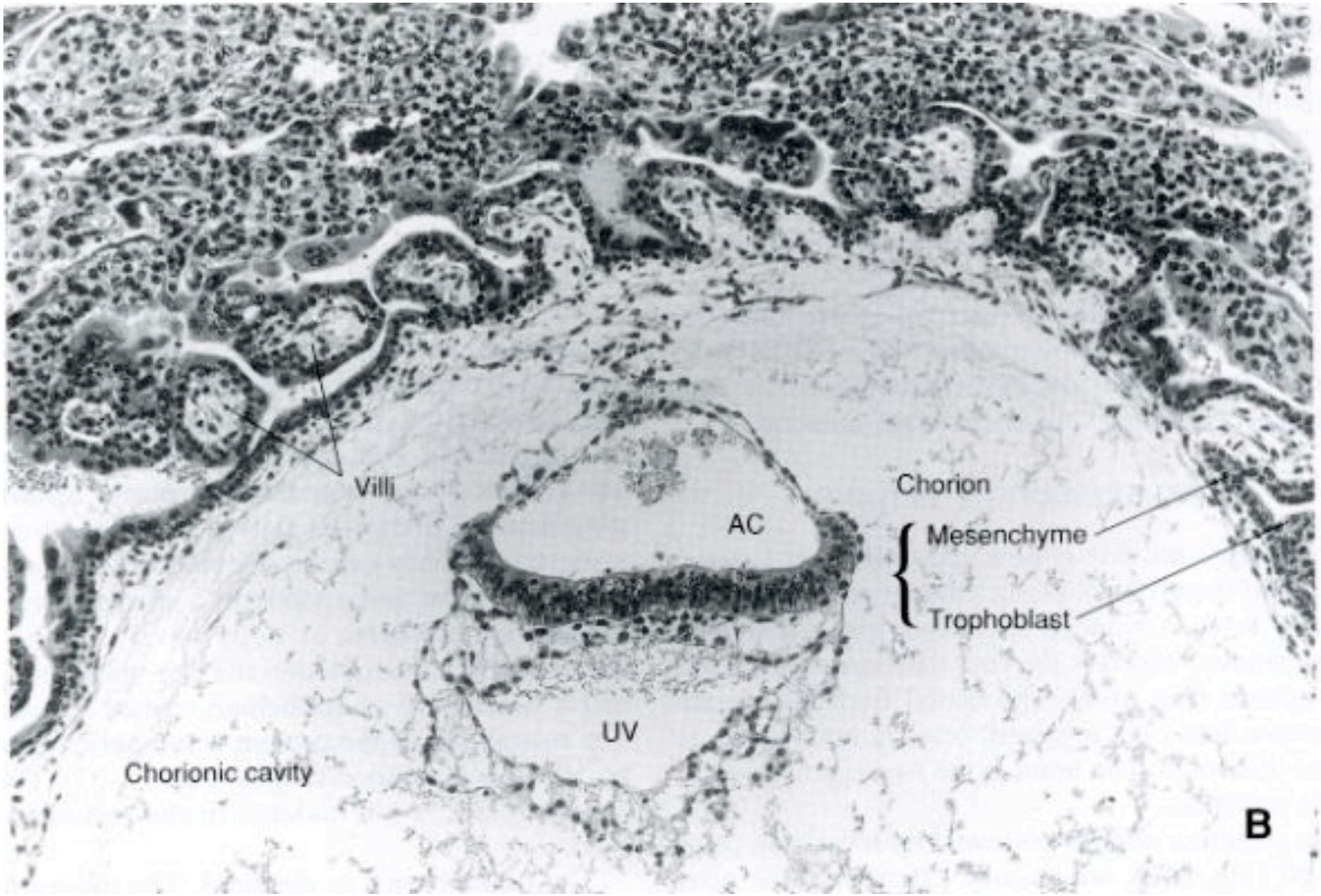
- Gestational sac
- Trofoblastireaktio
- Yolk sac
- 5+5 syke







A


Villi
AC
Chorion
Mesenchyme
Trophoblast
UV
Chorionic cavity
B

Umbilical vesicle = yolk sac

- primordial germ cells
- blood cells

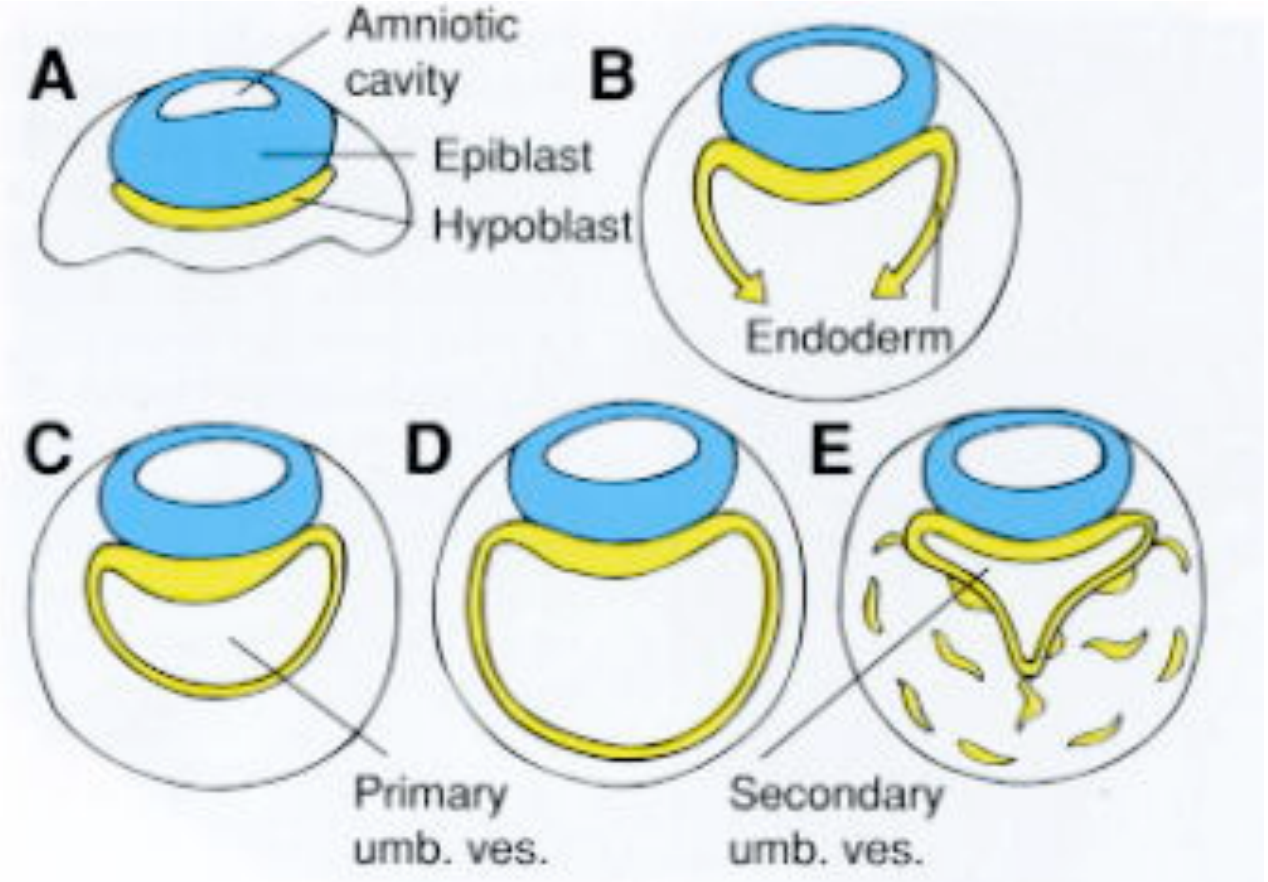
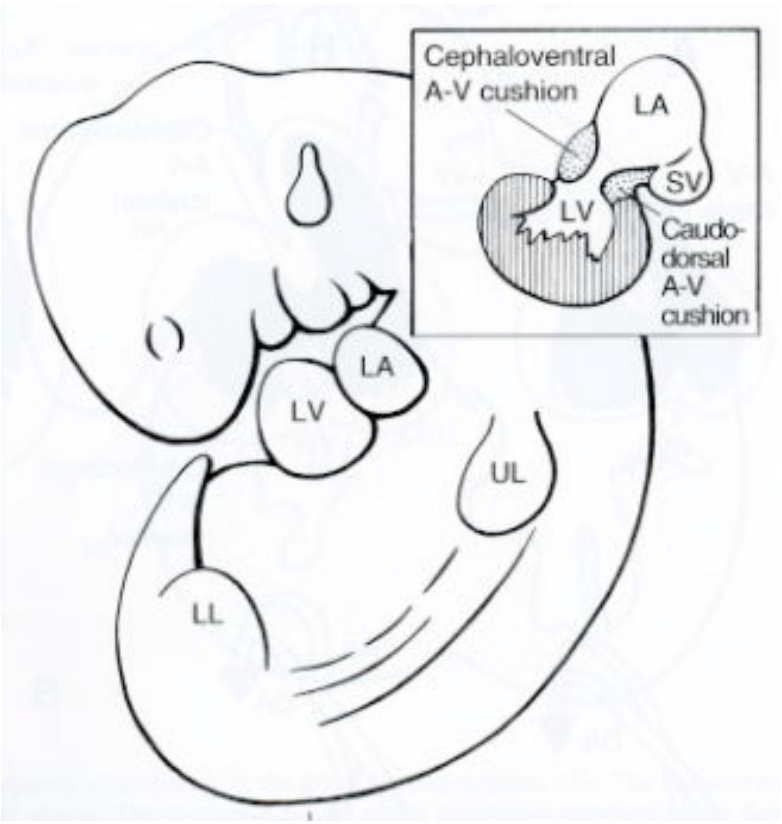


Fig. 5–5. One interpretation of the formation of the definitive

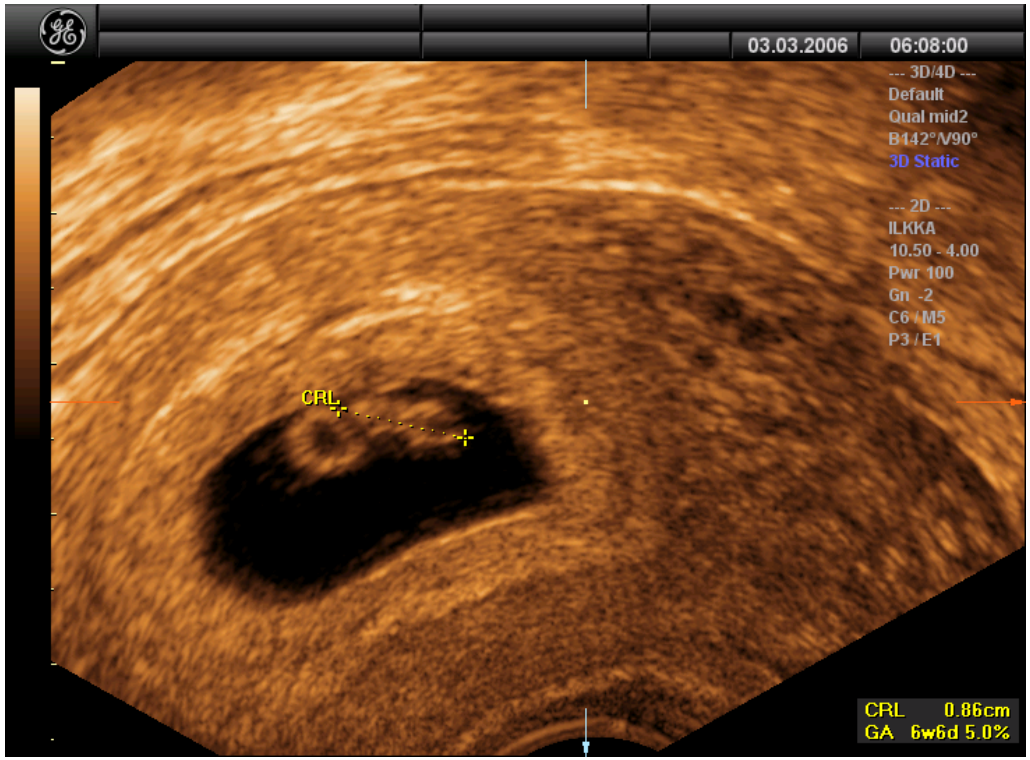
RVK 6


Cephaloventral
A-V cushion
LA
SV
LV
Caudo-
dorsal
A-V
cushion
LA
LV
UL
LL

SYDÄN

RVK 6

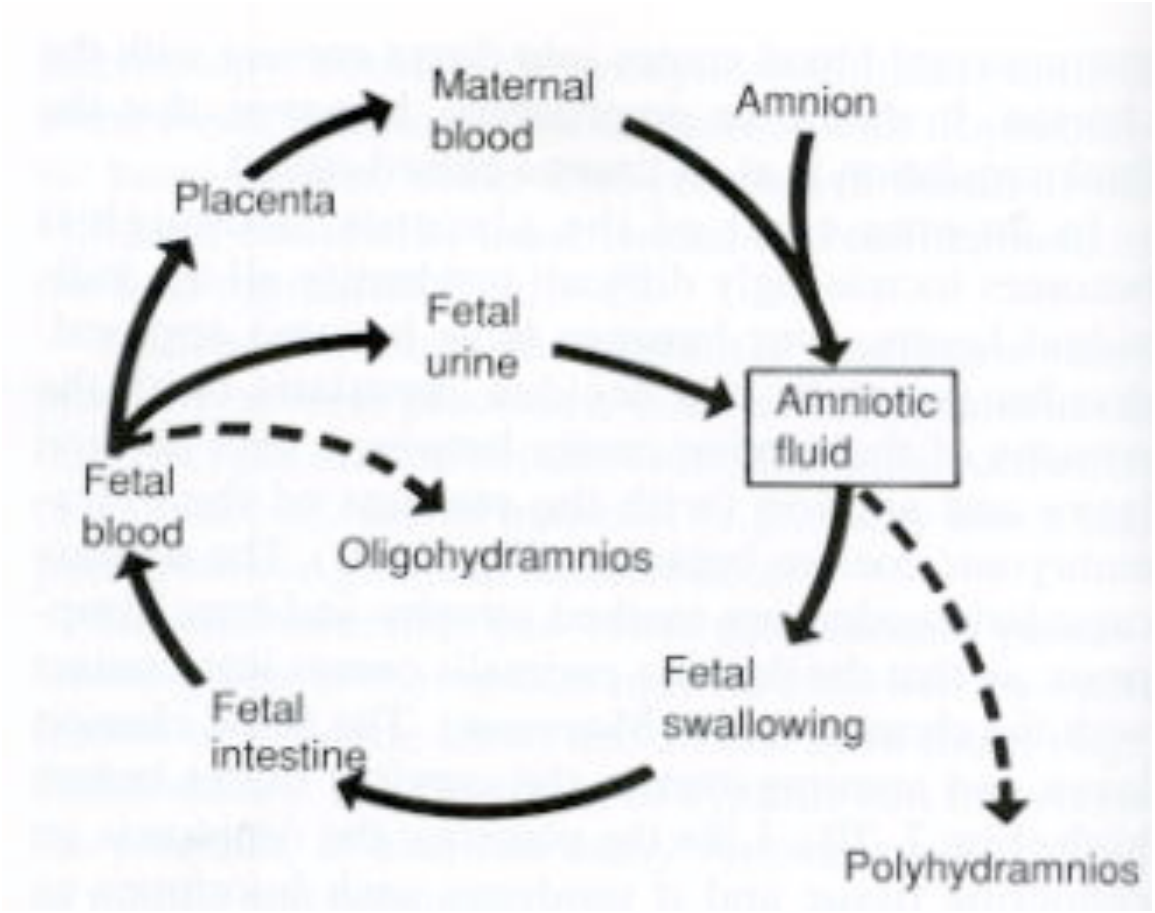
- Yolk sac = umbilical vesicle
  - primordial germ cells
  - blood cells
- syke
- alkio sijaitsee ruskuaispussin vieressä
- CRL mitattavissa



RVK 7

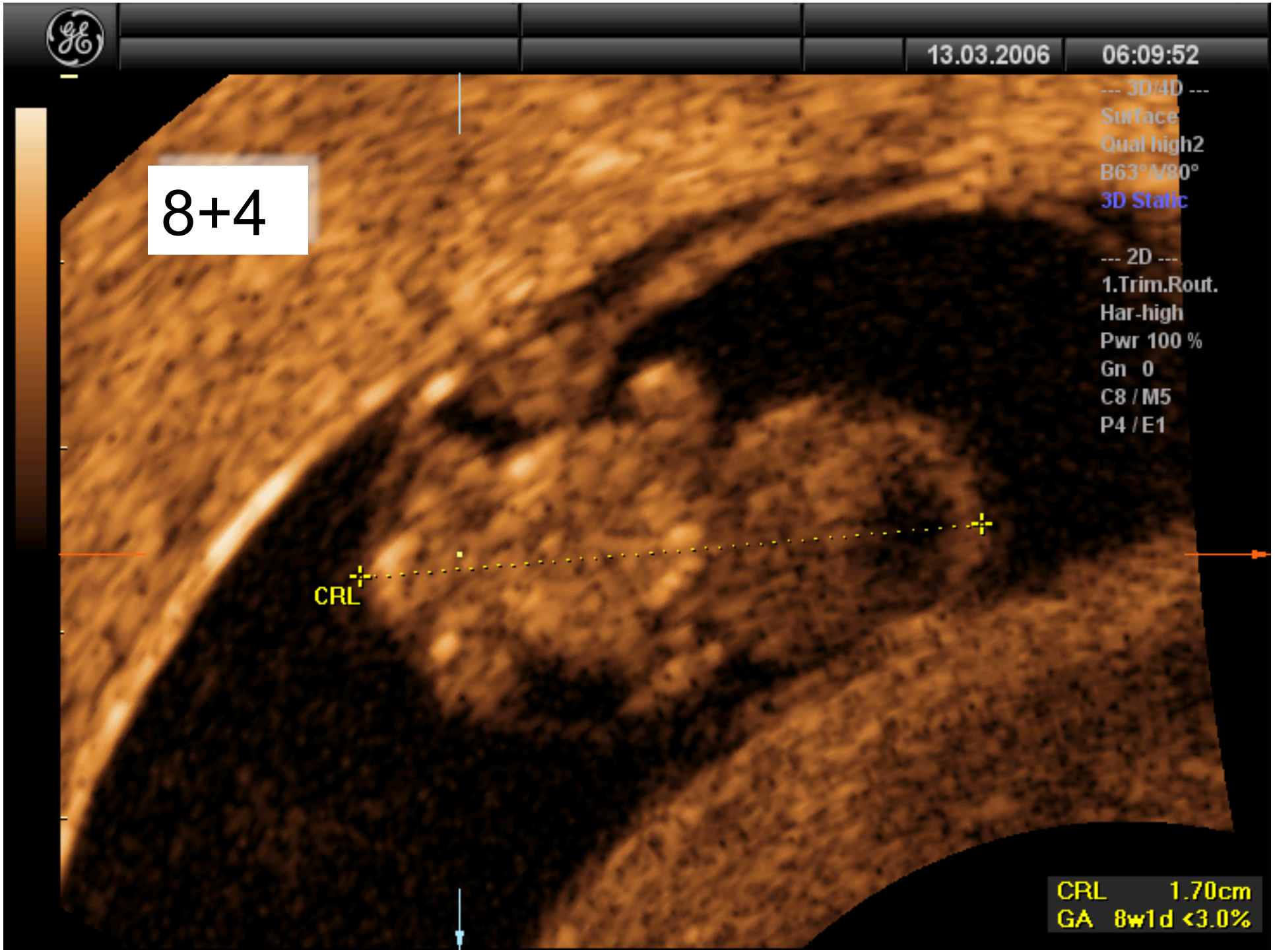
- CRL 9-15 mm
- pää voimakkaasti anteversiossa
- amnionontelo
- liike
- raajat

Amniotic fluid



RVK 8

- CRL 16-22mm
- raajat
  - liikkuvat
- pää selvästi erillään
  - liikkuu vartaloon nähden


13.03.2006
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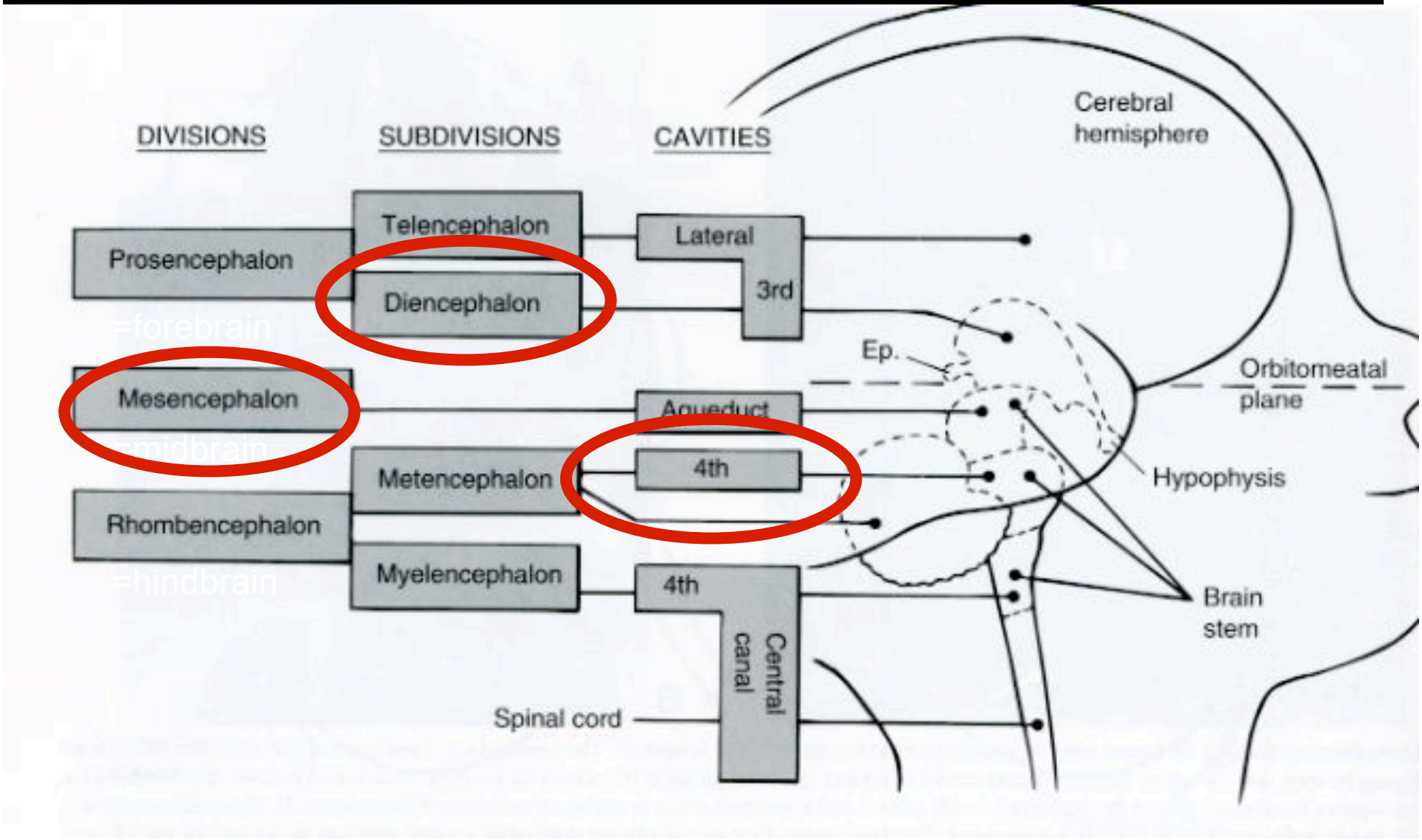
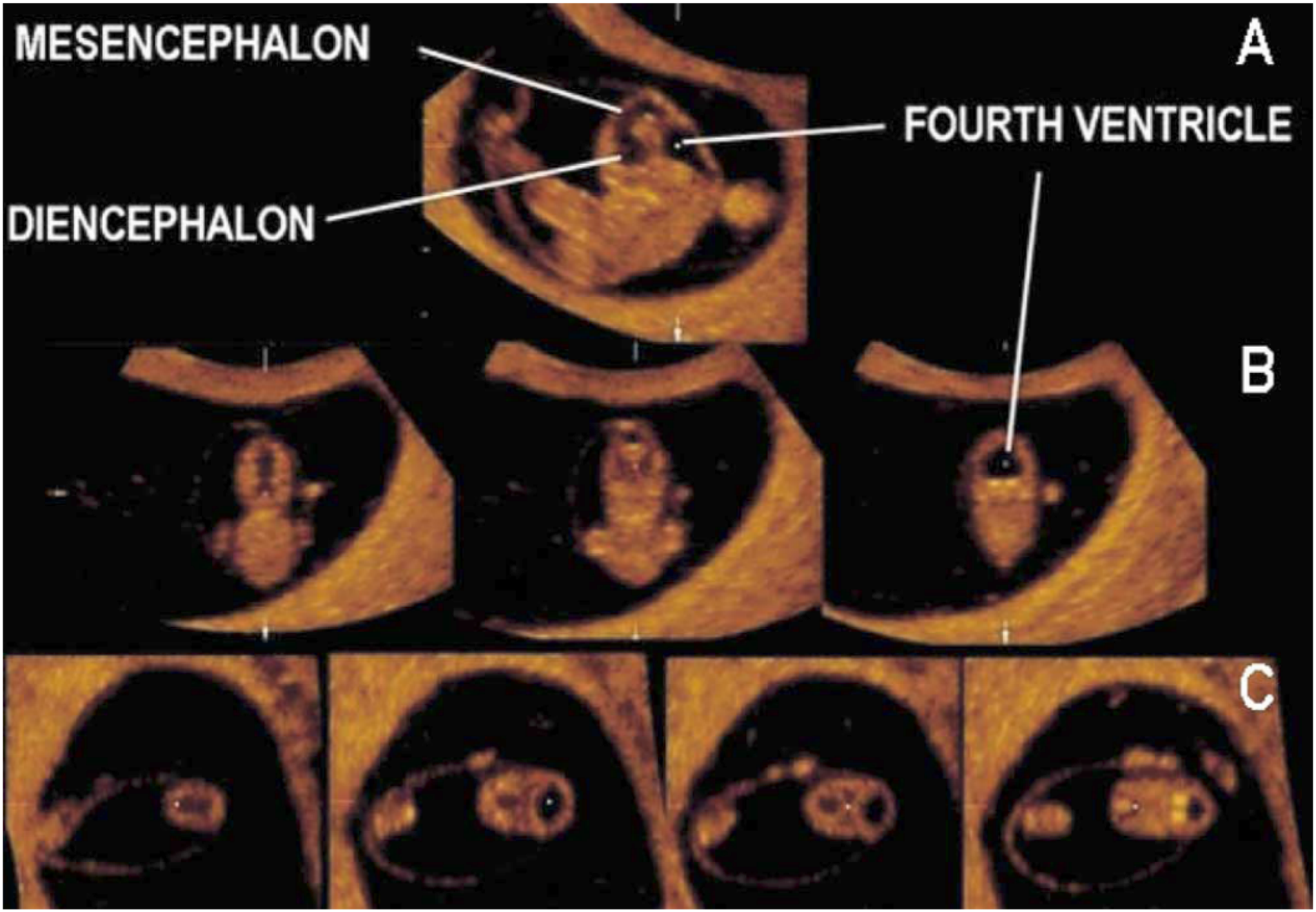
Surface
Qual high2
B63°/V80°
3D Static
--- 2D ---
1.Trim.Rout.
Har-high
Pwr 100 %
Gn 0
C8 / M5
P4 / E1
8+4
CRL
CRL 1.70cm
GA 8w1d <3.0%

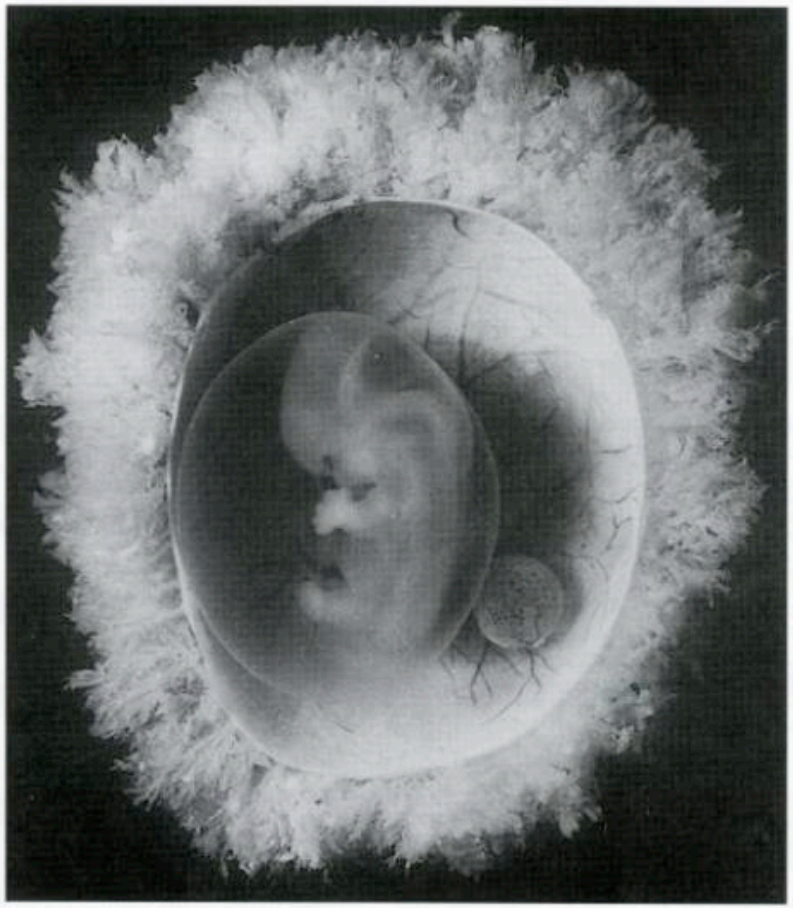

DIVISIONS
SUBDIVISIONS
CAVITIES
Cerebral hemisphere
Prosencephalon
Telencephalon
Diencephalon
Lateral
3rd
=forebrain
Mesencephalon
=midbrain
Aqueduct
Ep.
Orbitomeatal plane
Metencephalon
4th
Hypophysis
Rhombencephalon
Myelencephalon
=hindbrain
4th
Central canal
Brain stem
Spinal cord

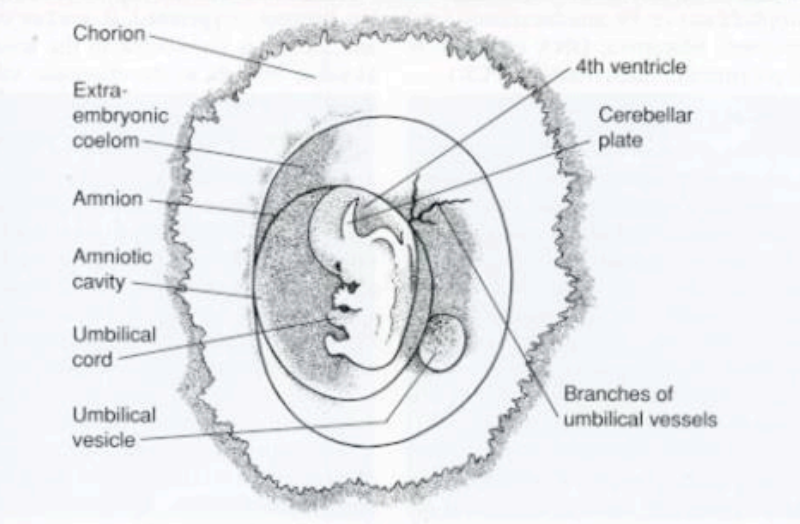
(**A**), coronal (**B**), axial sections (**C**) from above. The ventricular system is visible.

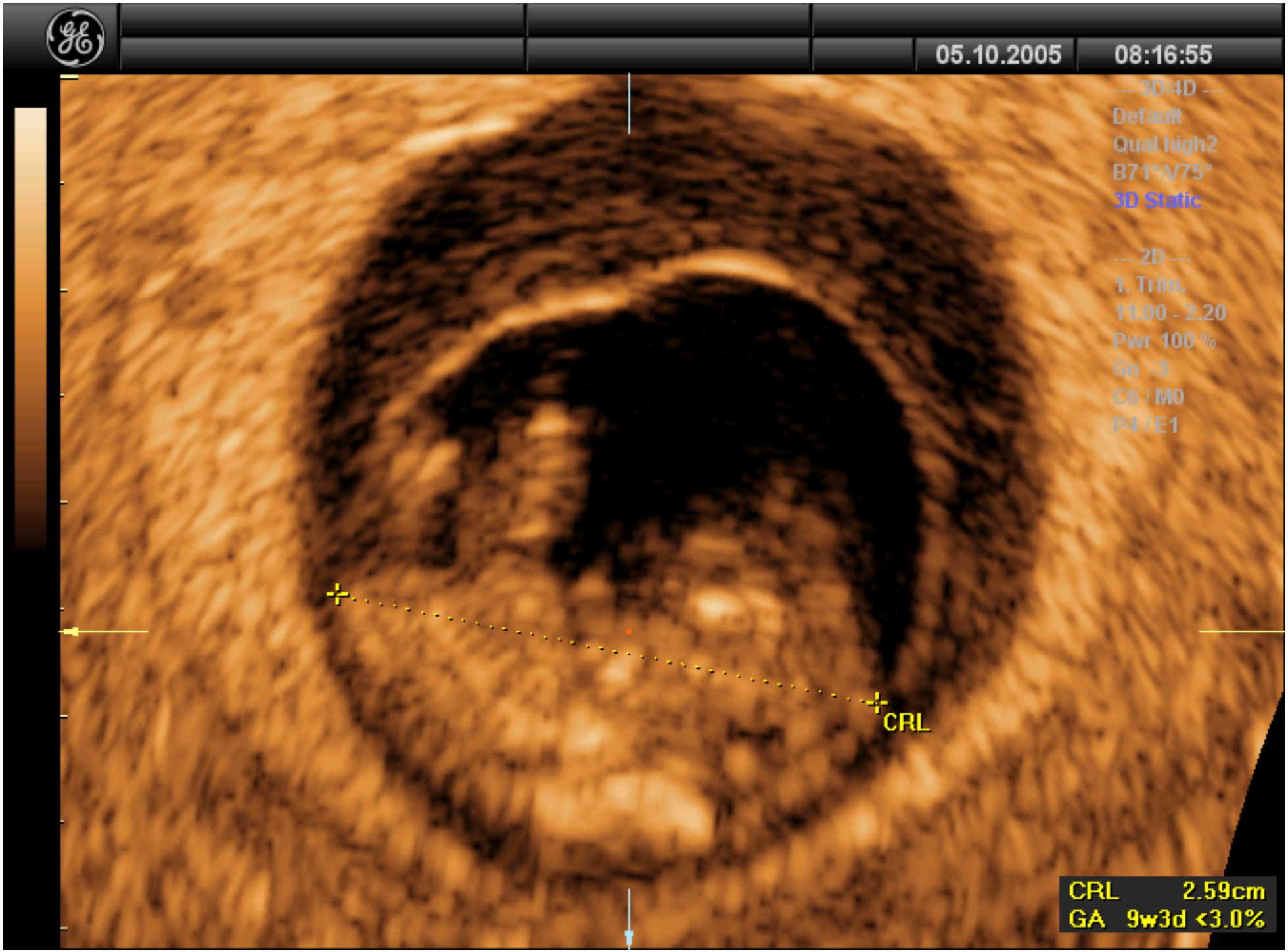


rvk 9

CRL 21-33 mm



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08:16:55
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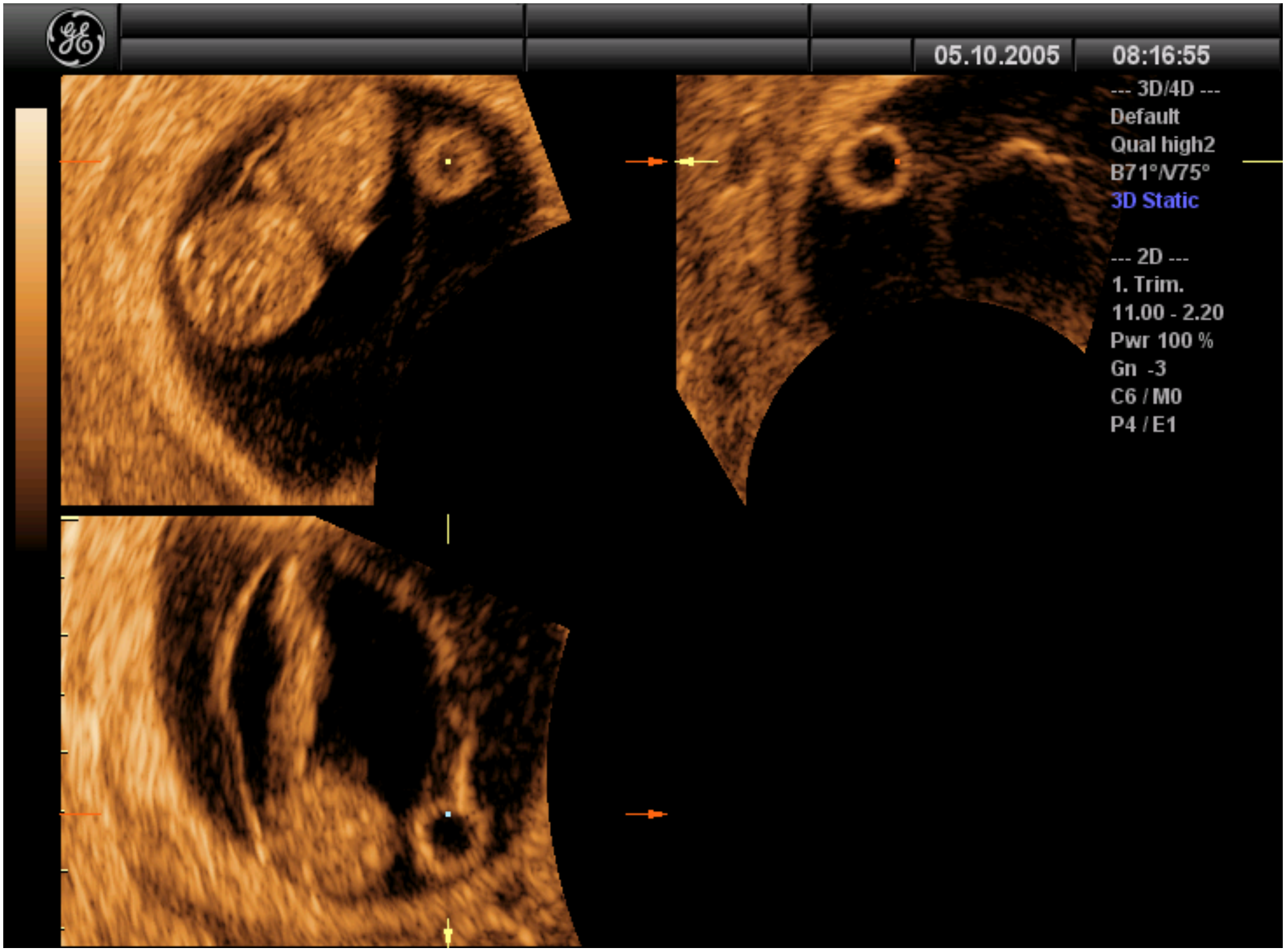
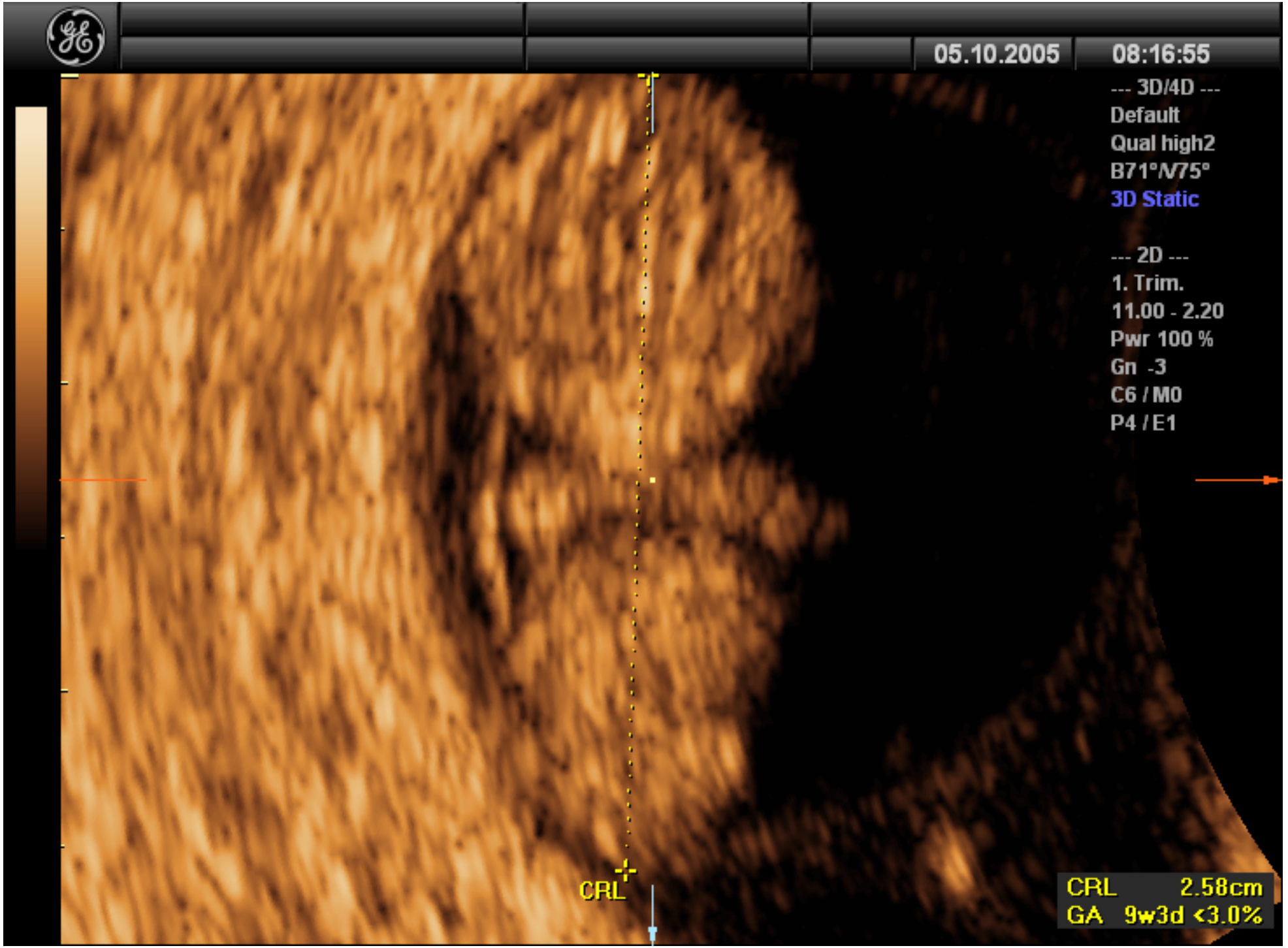
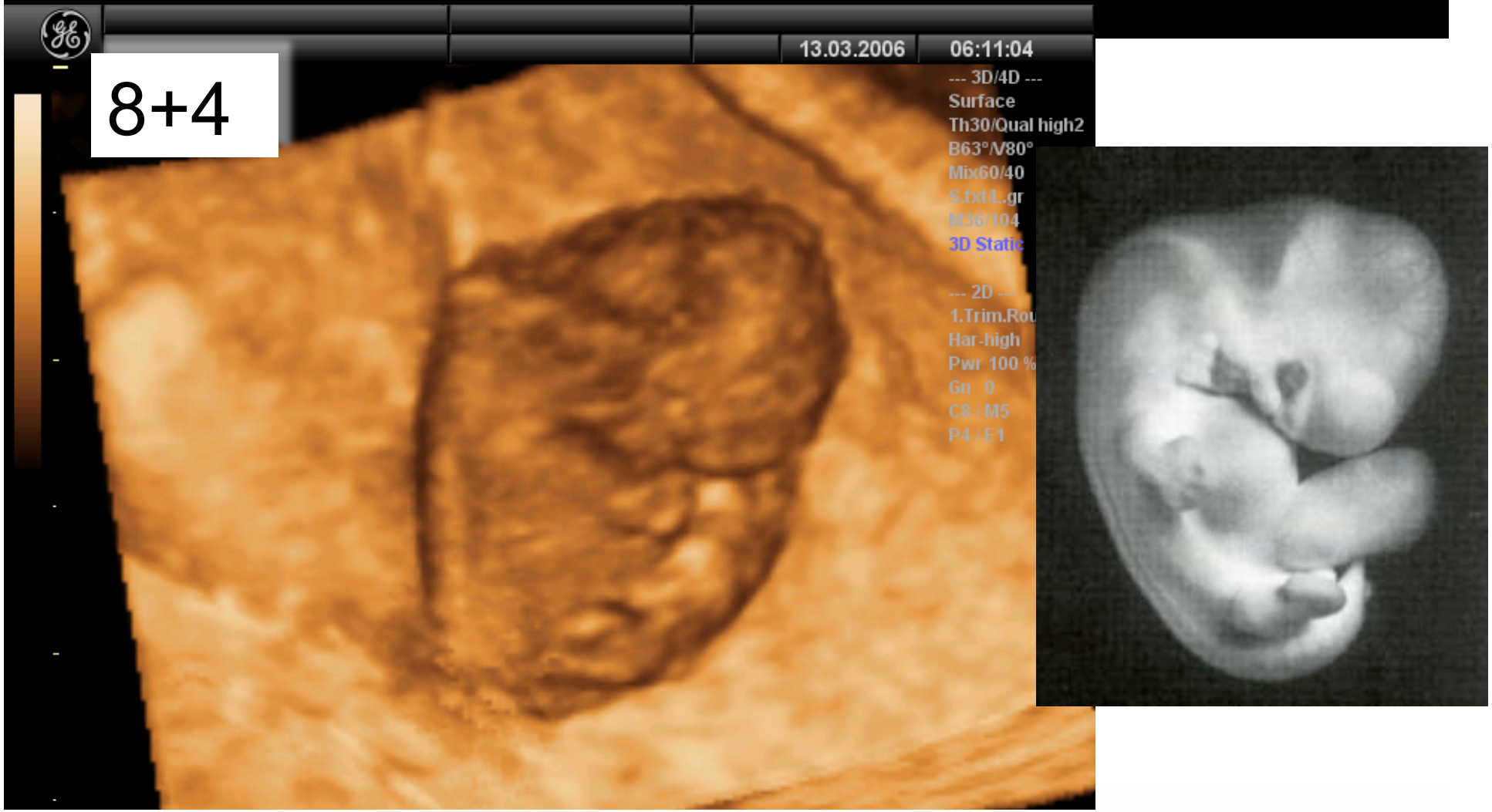
Default
Qual high2
B71°/V75°
3D Static
--- 2D ---
1. Trim.
11.00 - 2.20
Pwr 100 %
Gn -3
C6 / M0
P4 / E1
CRL
CRL 2.59cm
GA 9w3d <3.0%


05.10.2005
08:16:55
--- 3D/4D ---
Default
Qual high2
B71°/V75°
3D Static
--- 2D ---
1. Trim.
11.00 - 2.20
Pwr 100 %
Gn -3
C6 / M0
P4 / E1

Rvk 9


05.10.2005
08:16:55
--- 3D/4D ---
Default
Qual high2
B71°/75°
3D Static
--- 2D ---
1. Trim.
11.00 - 2.20
Pwr 100 %
Gn -3
C6 / M0
P4 / E1
CRL
CRL 2.58cm
GA 9w3d <3.0%

Rvk 8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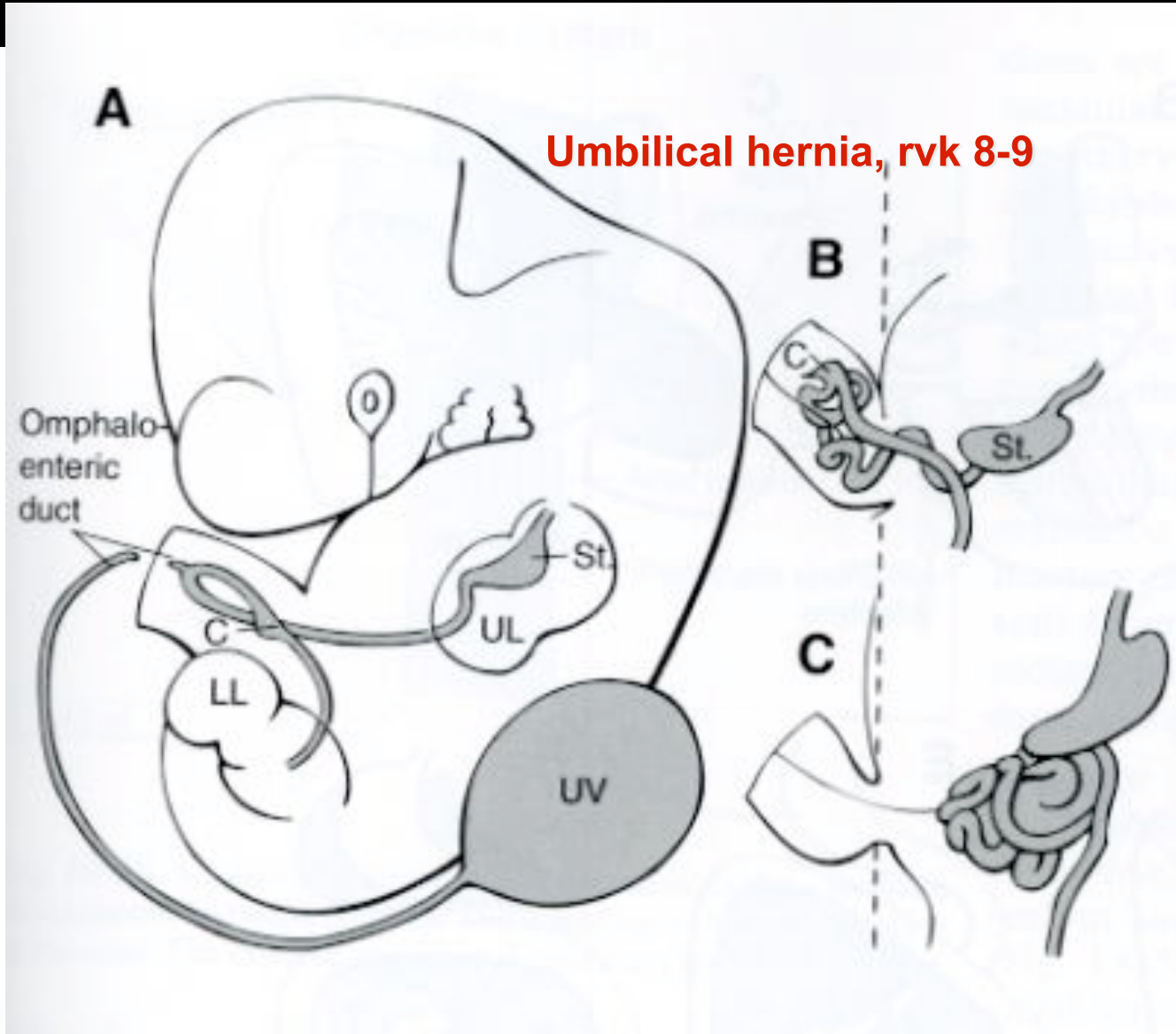
Th30/Qual high2
B63°/V80°
Mix60/40
S.txt/L.gr
M36/104
3D Static
--- 2D ---
1.Trim.Rou
Har-high
Pwr 100 %
Gn 0
C8 / M5
P4 / E1
8+4

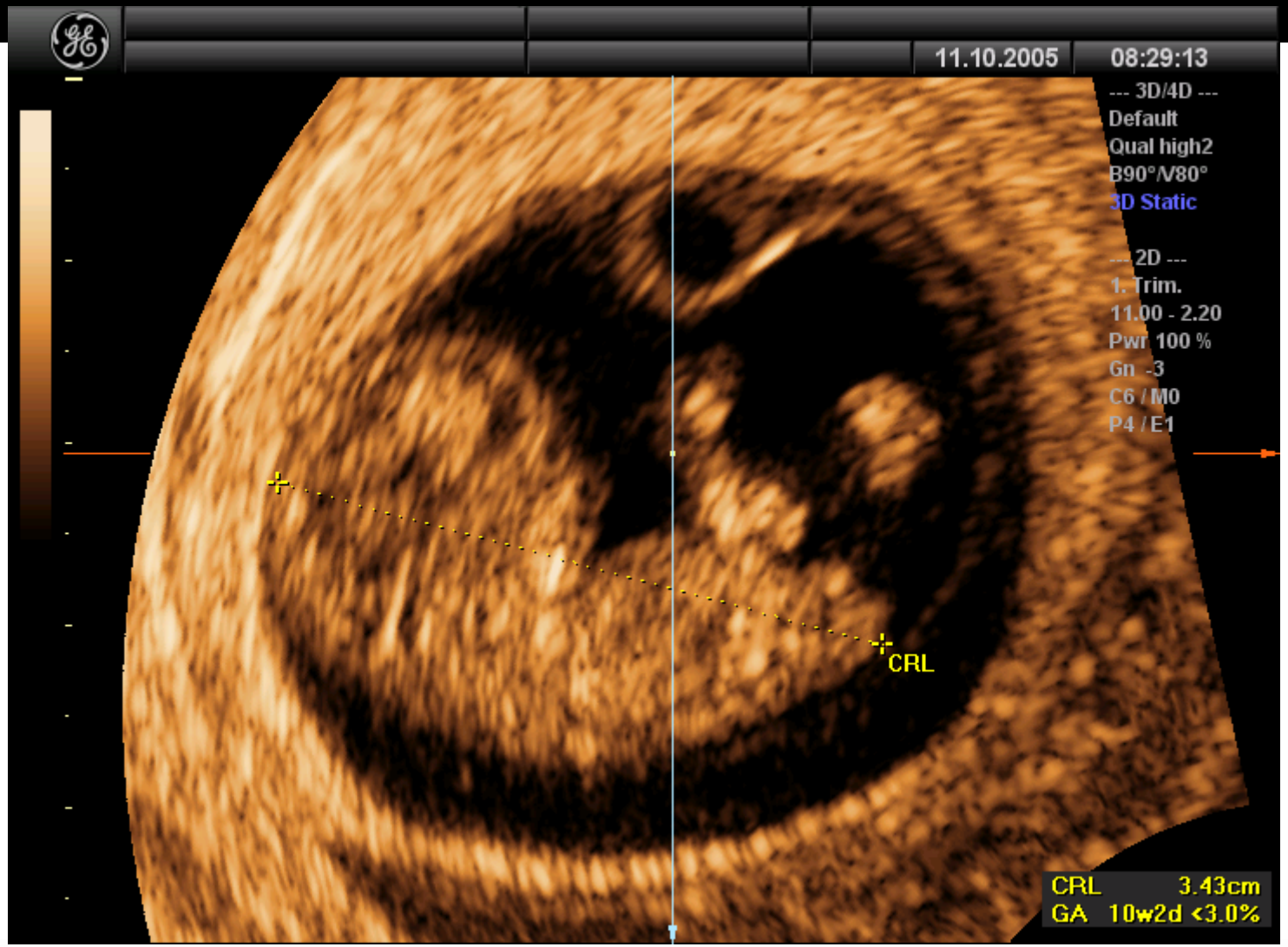
Midgut loop


A
Umbilical hernia, rvk 8-9
B
Omphalo-
enteric
duct
St.
UL
C
LL
UV
C
St.

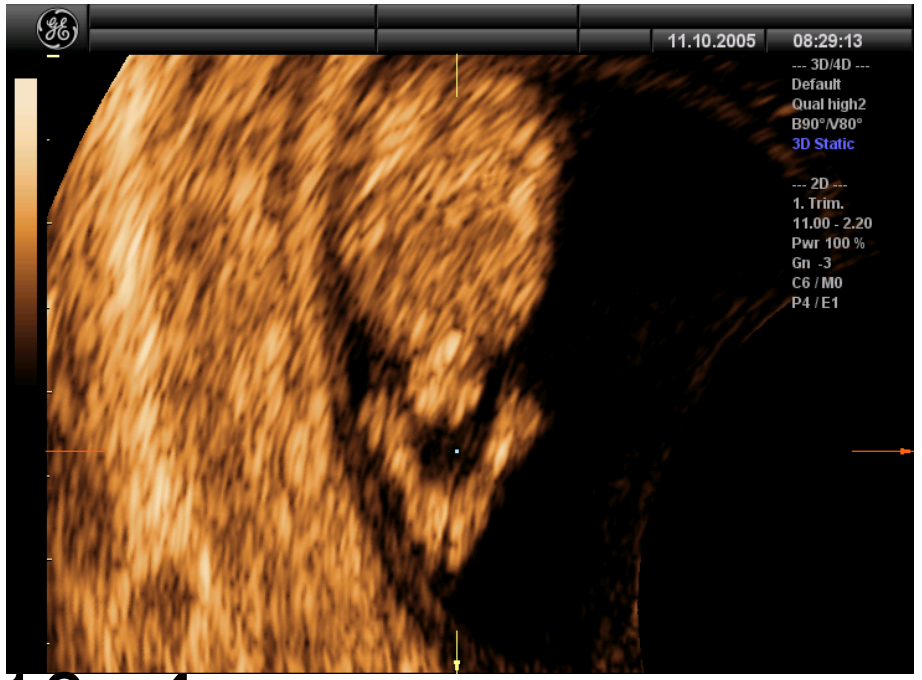
Rvk 10

- CRL 34-44 mm
- raajat pidentyneet

Rvk 10


11.10.2005
08:29:13
--- 3D/4D ---
Default
Qual high2
B90°/V80°
3D Static
--- 2D ---
1. Trim.
11.00 - 2.20
Pwr 100 %
Gn -3
C6 / M0
P4 / E1
CRL
CRL 3.43cm
GA 10w2d <3.0%

11.10.2005
08:29:13
--- 3D/4D ---
Default
Qual high2
B90°/V80°
3D Static
--- 2D ---
1. Trim.
11.00 - 2.20
Pwr 100 %
Gn -3
C6 / M0
P4 / E1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08:29:13
--- 3D/4D ---
Default
Qual high2
B90°/V80°
3D Static
--- 2D ---
1. Trim.
11.00 - 2.20
Pwr 100 %
Gn -3
C6 / M0
P4 / E1

RVK 10+4

11.10.2005
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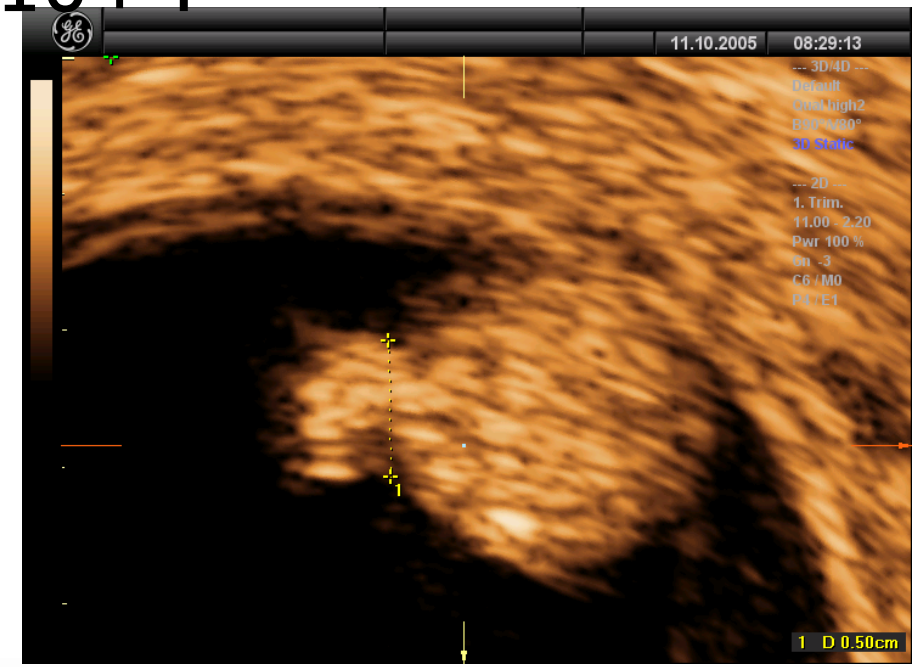
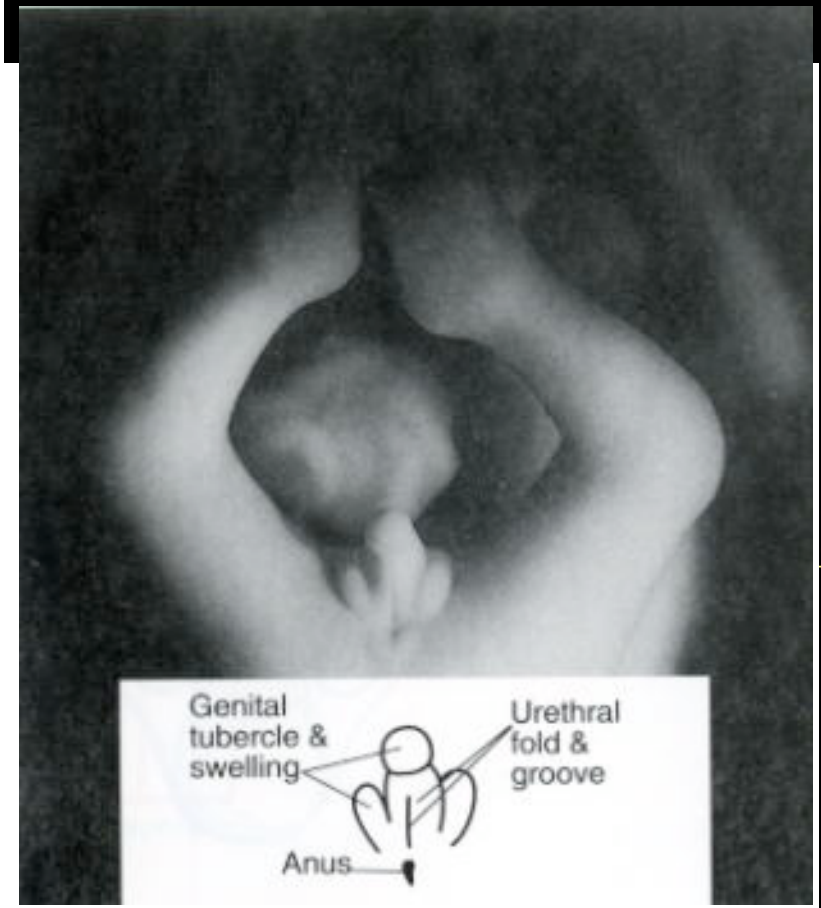
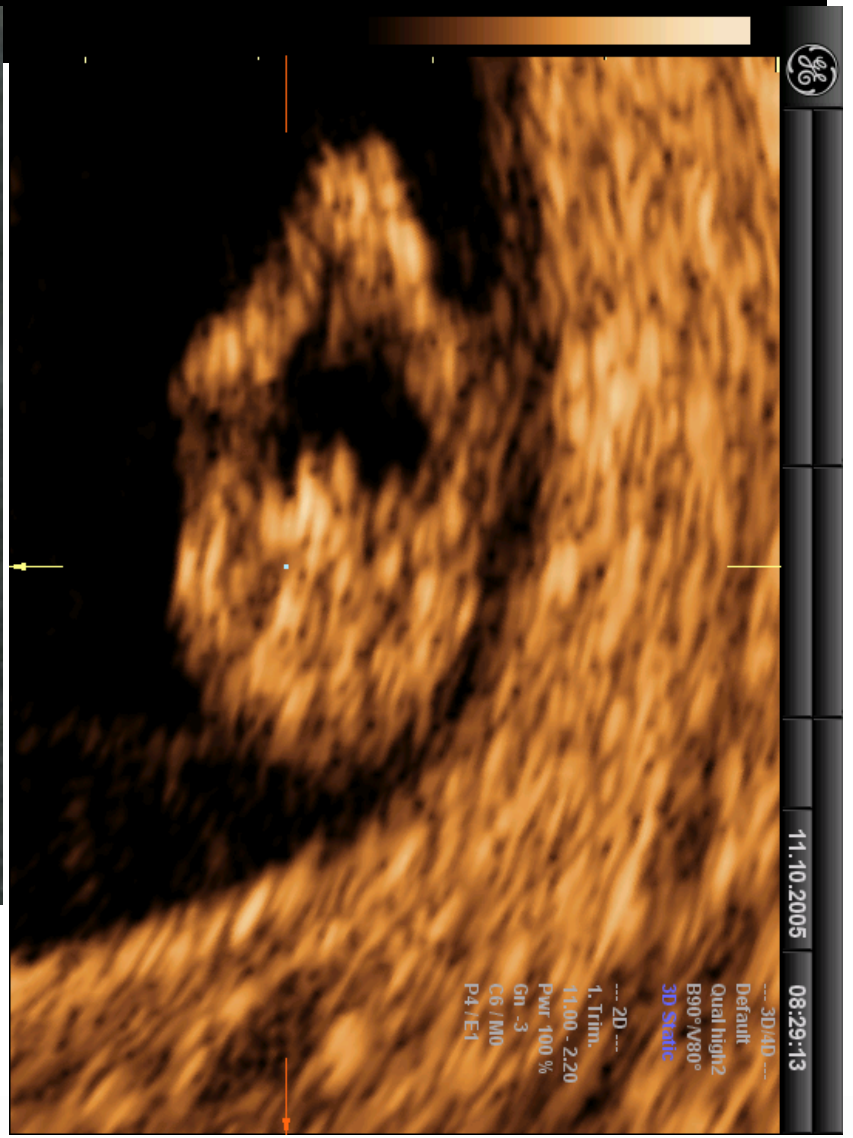
--- 2D ---
1. Trim.
11.00 - 2.20
Pwr 100 %
Gn -3
C6 / M0
P4 / E1


11.10.2005
08:29:13
1 D 0.50cm

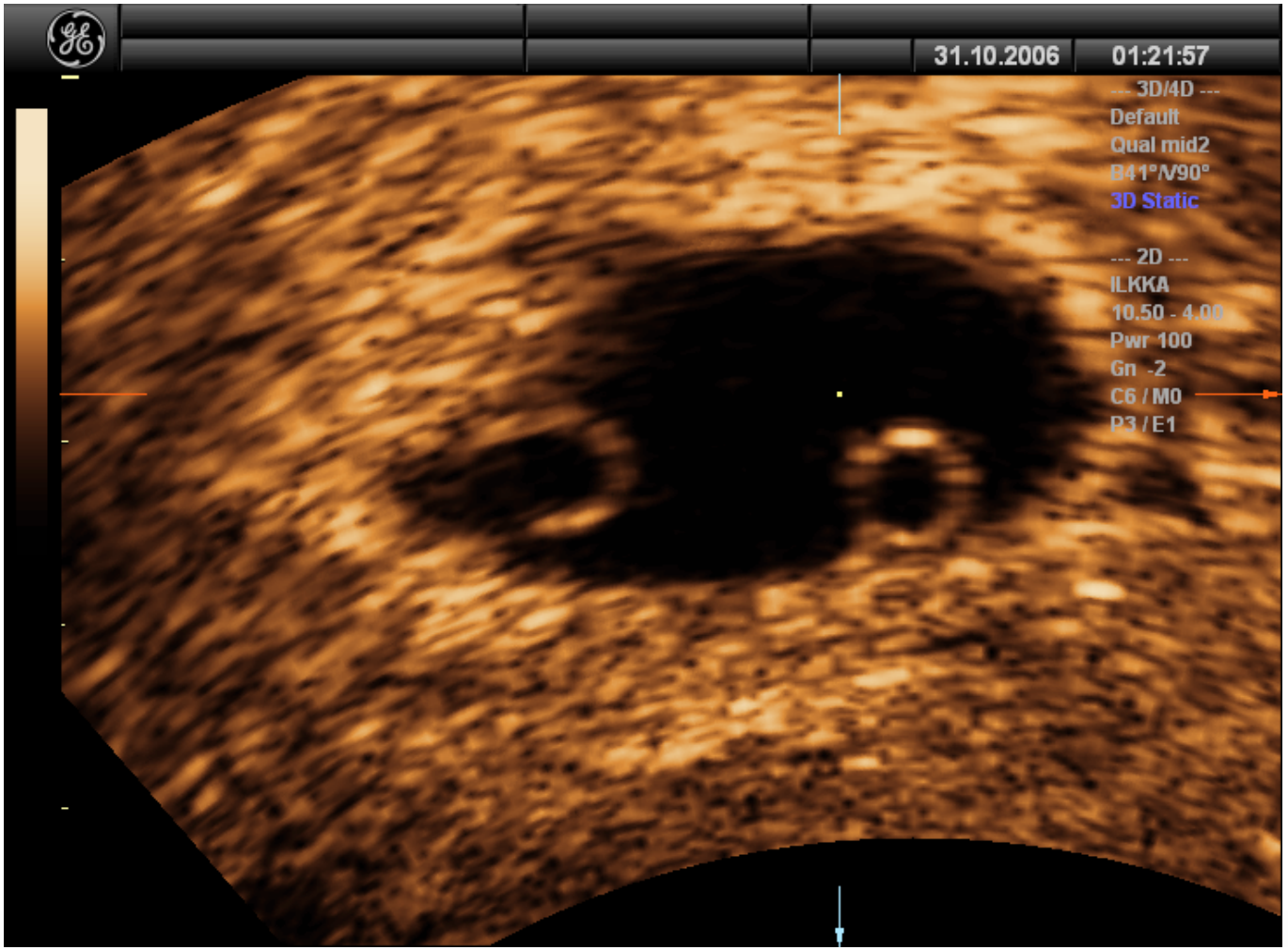
Rvk 10


Genital
tubercle &
swelling
Urethral
fold &
groove
Anus

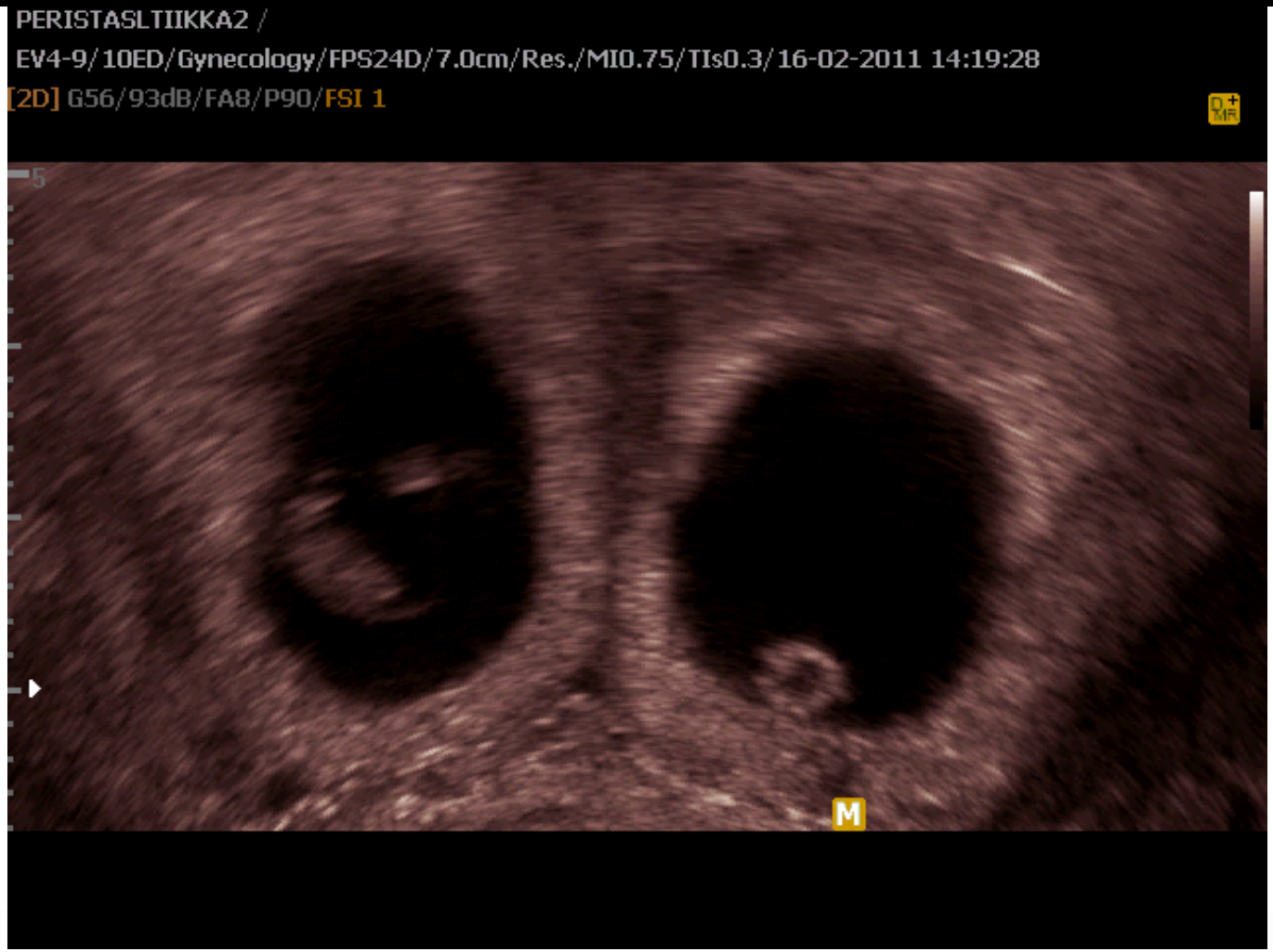

11.10.2005
08:29:13
--- 3D/4D ---
Default
Qual high2
B90°/V80°
3D Static
--- 2D ---
1. Trim.
11.00 - 2.20
Pwr 100 %
Gn -3
C6 / M0
P4 / E1

Gemini:
mono- vai dikorionaalinen?

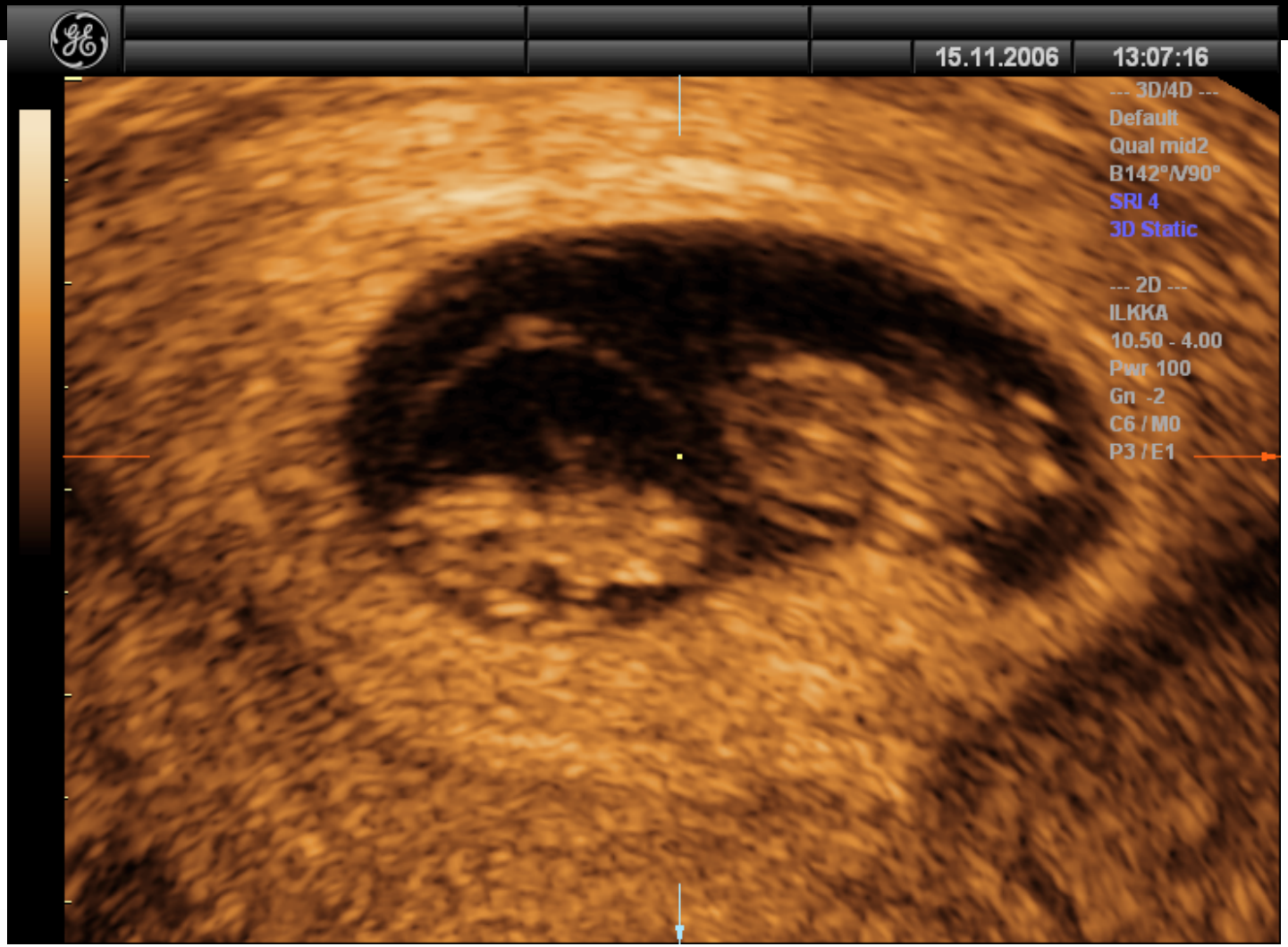
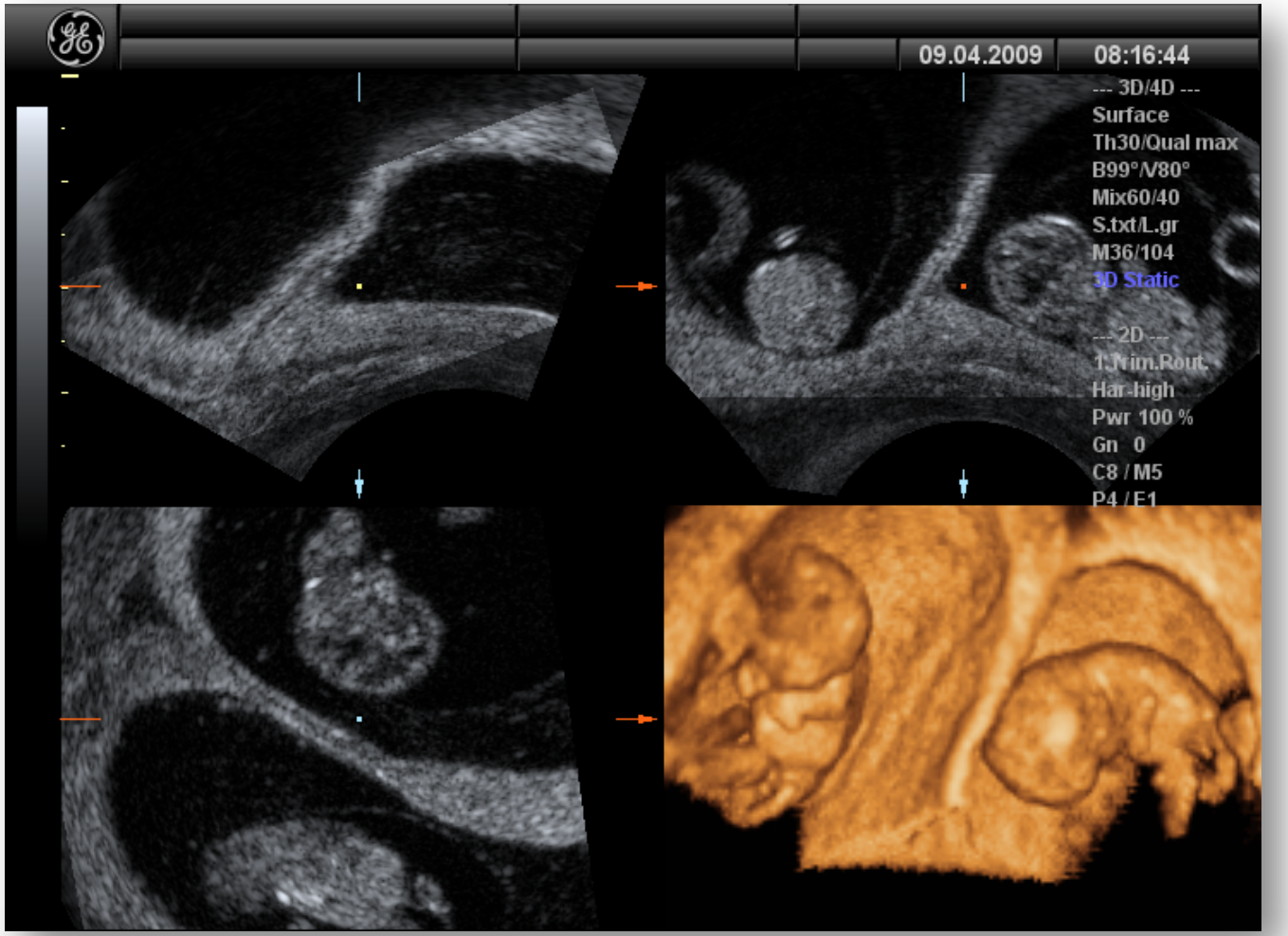
Monokorionaalinen 5+6



Dikorionaalinen 7+2



Monokorionaalinen 8+5



Dikorionaalinen 9+2